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ANNALS
OF
OPHTHALMOLOGY
AND
OTOLOGY

A QUARTERLY JOURNAL OF
PRACTICAL OPHTHALMOLOGY, OTOLOGY,
LARYNGOLOGY AND RHINOLOGY.

EDITED BY
JAMES PLEASANT PARKER, M. D.

SAINT LOUIS, MISSOURI.

VOLUME III.

SAINT LOUIS, MISSOURI, U. S. A.

1894.

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ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY.

JANUARY, 1894.

HOW CATARACT PATIENTS' EYES ARE DRESSED
AT THE PRESBYTERIAN EYE, EAR, AND
THROAT CHARITY HOSPITAL, OF
BALTIMORE.

BY JULIAN J. CHISOLM, M. D., LL. D.,
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DISEASES IN THE UNIVERSITY OF MARYLAND.

IN the manual for cataract operations there is now but little difference exhibited in the work of experienced ophthalmic surgeons. Clean instruments are deemed essential by all. For several years I have sterilized them by immersion in boiling water for five minutes at least before using them. After using they are always washed in hot water before being put away. This method seems perfect, and leaves nothing to be desired. When I enter the operating room the first act of the nurse is to light the gas under the hot water kettle. I have been in the habit of washing the entire conjunctival surface with sublimated water 1 to 4,000, using an eye irrigator throwing a single stream with some force. I have often doubted whether this washing subserves any good purpose. In such healthy eyes as operated upon I do not believe that there are any pathogenic germs to be washed away. If such microbes were on the conjunctiva, I equally do not think that the use of the forcible stream could dislodge them; nor do I believe that the momentary application of the sublimate solution would destroy them. The wiping of the everted lid-surfaces with a piece of cotton wetted with the sublimate water can only be for the mental relief of the operator. It belongs to the list of "horseshoe over the door" remedies which should have no place in enlight-

ened surgery. I have seen skilful surgeons going seriously through this performance as if the subservient microbes only promenaded upon the smooth surfaces of the tarsus, and therefore there was no need to seek them in the deep recesses of the conjunctival fornix.

All extractions I perform under cocaine, in the operating room of the hospital, on an operating table placed conveniently before large windows. The simple extraction without an iridectomy has been for several years the rule of the hospital, and with rare exceptions has been most satisfactory. Iritic hernias will now and then occur, even in cases which promised the best results for the first few days after the operation. While I have never lost an eye from this accident, the cutting off of the protrusion retards the healing, and makes the convalescence much more protracted. When these prolapses occur, which is in about eight per cent of my simple extractions, I have a secret admonition that a primary iridectomy would have been the better operation, even if the eye did not look as beautiful after it. In my experience, hernias appear with great irregularity, and can be traced to no recognized cause. Extracting cataracts, as I do very frequently, sometimes I do not see an iritic protrusion for months, until I even begin to think that a larger experience and greater manual in dexterity has at last eliminated this accident from my list of surgical troubles. Then one, two, or even more prolapses will occur in a comparatively short period, in proof that I am to be no more successful than my colleagues in eye work. While a lost eye from cataract operation is now among the rarest of accidents, with or without iridectomy, I sometimes believe that on the whole, the iridectomy will insure the speedier convalescence. This conclusion I have come to after operating upon upwards of 500 without, and over 1,500 with iridectomy. Were I called upon to operate on a case to be afterwards treated by the family physician, I feel that I could leave the patient more safely in such unskilled hands by making an iridectomy; because the too early inspection of the eye through innate curiosity could then do no harm. After an iridectomy under such circumstances, a permanent dressing of isinglass plaster would be applied which should not be removed for five days, and after which no further dressing would be required.

The corneal wound I always make large so as to allow of the easy escape of the lens. Transfixion of the cornea is made near its equator, the height of the flap depending upon the consistency of the lens substance, and the size of its nucleus. All lens substance is removed by corneal pressure. Washing out the anterior

chamber I have abandoned as a needless and somewhat dangerous innovation. The iris usually resumes its normal position without help. Should the pupil be irregular in outline, by means of a shell spatula the iris is smoothed out from the corners of the corneal wound where it seems to have been caught.

With my present method of extracting without iridectomy I have had to abandon the adhesive strap dressing. In iridectomy cases the ready healing of the corneal wound could be so surely relied upon, that it was not necessary to inspect the eyeball until it was ready for release from further dressing, on the fifth day after the operation. Under such a condition, the transparent, soft isinglass strip made the most perfect of dressings. If properly applied, it stuck to the lids closely and surely. The single application would keep the lids well stuck together for as many days as were necessary. It made no injurious pressure; it made the lids support perfectly the corneal wound; the dressing could not become deranged; its translucency enabled the surgeon to inspect daily the lids and detect any secretion without molesting the dressing. Every indication for treatment was met by this perfect eye band. When extracting senile cataracts without iridectomy became the established operation of the hospital, the fear of iritic hernia made a daily inspection of the eyeball necessary. It was found that the isinglass strip was not the most convenient dressing when a daily renewal was required, and therefore the single Lebright eye bandage was adopted. It is a quadrangular piece of folded muslin, three inches long by two inches wide, with long tapes extending from each corner for securing it to the head. Over the closed eye is placed first a square of felted absorbent cotton, known as the "cottonoid surgical dressing." This is usually wetted with the weak sublimate solution, more as a sterilized water to soften the felt, than an antiseptic application. A very thin wad of cotton wool is placed over this and the whole secured by the single-eye bandage, lightly tied on the opposite temple so as to exercise no pressure on the eyeball. I do not bake any of this material. I find it a safe application without being especially sterilized.

As is well known, I have for many years applied the dressings only to the eye operated upon, leaving the other eye untrammelled, and therefore for use by the patient. As soon as I was thoroughly convinced by numerous and carefully conducted contrasting experiments, that an equally good per cent of perfect results could be obtained whether both eyes were bandaged or only one of them, I gave my patients the benefit of my discovery, with the comforts

and privileges belonging to it. I learned to my absolute satisfaction that the leaving open of the eye that was still useful did not increase the dangers of complications. My experience in several hundreds of cataract extractions, with final results which compare favorably with a similar series of operations by those who are accustomed to pursue the most rigid course of bodily restraint, fully sustains me in the liberty of movements which I allow my cataract patients. When the dressings have been applied the patient gets down from the operating table. If he has sight enough in the exposed eye he walks to his room, from which the sunlight has been shut out by a dark blue shade, which does not make, however, the room gloomy. The patient can see to walk about, to feed himself, is allowed to dress himself, and to attend to his general wants without calling constantly for the nurse. When this liberty is known to be not injurious, patients consider them great privileges when contrasted with the dependent condition of being blindfolded and confined to bed. The eye is inspected daily, the light of the room being quite sufficient for this purpose. By the third day the wound is found healed and then an atropia drop is instilled. On the fifth day the bandage is permanently removed. Slowly the eye becomes accustomed to the light, so that by the fourteenth day after the operation it can stand exposure to ordinary daylight, and the patient is ready to leave the hospital.

In operating upon children, for soft or congenital cataracts, when I have made the pupil fully dilated by atropia, I make a free incision in the anterior capsule, quite long enough to allow some of the lens substance to protrude into the aqueous. I apply no dressings to the eye for closing it up. I find it much more advantageous to apply the bandage to the little patient's hands, for one day at least, to prevent them from rubbing the eyes. Atropia is used three times a day to ensure complete dilation of the pupil. The little wrist-band, passing from one arm to the other behind the back, and permitting, as it does, of many movements, does not in any way fret the child. In the meantime, the eye is safe from injury, with child, nurse, and parents happy. When the eyes are bandaged and the child, as usual, restless, the dressings secured to its round head will frequently become disarranged; and a sleepless child, a wornout nurse, and an anxious mother greet the surgeon on the morrow of the operation. I have had great satisfaction in needling soft cataracts since I abandoned the tying up of the eye operated upon.

DESTRUCTION OF THE EYE BY HEMORRHAGE
FOLLOWING CATARACT EXTRACTION.¹

BY EDWARD JACKSON, A. M., M. D.,

PROFESSOR OF DISEASES OF THE EYE IN THE PHILADELPHIA POLYCLINIC;
SURGEON TO WILL'S EYE HOSPITAL.

MRS. F., age 75, applied at the eye clinic of the Philadelphia Polyclinic, May 20, 1891. Her sight had been failing for more than a year and she gave a history of headache. She was a large, fleshy woman, in fair general health. She brought into the hospital with her a mixture containing morphia, which she had previously been taking.

In the right eye a diffused haze of the deeper media prevented a clear view of the fundus. There appeared to be a broad shallow cup, the disc was dark gray, the edge of the cup somewhat uncertain as to whether it extended quite to the edge of the disc, which was surrounded by a halo of choroidal atrophy.

The left eye presented a dislocated lens, densely hazy, so that only a faint fundus reflex was visible. It was dislocated downward; its edges appearing at the upper margin of the pupil when dilated to six millimeters.

Vision, Right, $\frac{15}{100}$. Left, light perception, and a fair projection throughout the field. There was a chronic catarrhal conjunctivitis, which was treated with applications of silver nitrate, and the case kept under observation for a few days.

May 25. The dislocated lens was removed from the left eye by simple extraction without the use of the wire-loop, or of any fixation of the lens. Simple extraction was preferred, because it was believed that by avoiding the upward extension of the pupil, the lens could be expelled without loss of vitreous, and this was accomplished. The pupil became circular, central, and moderately contracted without any vitreous presenting in the wound. The eyes were then closed and bandaged and the patient left lying upon the operating table. One-half hour later I was called to see her.

A few minutes after the completion of the dressing, she began to complain of pain in the temple and back of the head, which increased, became extremely severe, and forced her to move about in seeking to ease it. When I reached her the dressing was already soaked through with blood. Upon removing it a clot, the size of a small walnut, was found between the lid attached to which were noticed remains of vitreous. Dark blood was escaping from the corneal wound rapidly.

The recollection of the teaching of the late D. Hayes Agnew that position was the first step in the checking of hemorrhage came to me as the

¹Read before the Section on Ophthalmology of the College of Physicians of Philadelphia.

only practical method of meeting the emergency; and I at once placed the patient upright, with the feet hanging at the side of the table. Almost immediately the bleeding ceased; the pain gradually lessened, and, cutting away so much of the clot as lay outside of the gaping corneal wound, the eye was again dressed under some pressure.

There was no continuance or recurrence of the bleeding. The patient complained from time to time of severe pain, which has continued until the present time, as has her refusal to permit the enucleation of the eye for its relief. With the shrinkage of the clot, the lips of the corneal wound gradually came together. The eye was kept cleansed with a solution of mercuric chloride 1:5000, and atropine used twice daily.

June 6. The anterior chamber was re-established and the patient was permitted to leave the hospital. There was now general hyperemia of the globe, a mild inflammation without general suppuration. The eye continued to shrink irregularly and to be the seat of considerable pain, which the patient is probably disposed to exaggerate.

In the *right eye*, the notes show that by November, 1891, there was a deep cup extending the full width of the disc. The fundus was dim, apparently from haziness of vitreous.

In January, 1892, the disc and larger vessels were barely distinguishable through this haze. There had been no increase in the opacity of the lens and there was no marked limitation of the visual field.

In October, 1892, the fundus was still more hazy; vision reduced to counting fingers at eight feet. In August, 1893, the eye was substantially the same. Vision, counting fingers at four feet. At no time has hemorrhage been observed in the fundus of the right eye.

The practical point in this case which impressed me most strongly was the prompt checking of hemorrhage by position, and the obvious deduction that in a case of this kind it would be better to operate with the patient sitting up, and to keep the patient with the head raised for sometime after the operation. I have followed this plan in three cases where the patients were women of large frame and quite fleshy. On one of these patients I had done iridectomy for glaucoma some years before. She had passed from under my care and in the interval suffered absolute glaucoma in the second eye. These patients did well and the corneal wound exhibited prompt and normal healing.

The clinical history of this patient, extending now more than two years after the operation, seems to favor the belief that hemorrhage after cataract extraction is closely allied to a tendency to glaucoma. And, perhaps, the operation, the result of which was so immediately disastrous, has been of value to the patient by preventing any attempt to operate upon the remaining eye and thus preserving some useful vision for the period that has since elapsed.

In discussion of the above case, Dr. Charles Hermon Thomas said: "A case of hemorrhage during cataract operation occurred in

my hands many years ago, and very early in my practice. (1867) it being the second case on which I had been called upon to operate.

“The hemorrhage, which occurred immediately after the corneal incision and before any attempt at the removal of the lens, and, if I mistake not, before iridectomy was begun, was extremely severe. The blood gushed over the face and flooded the pillow. There was little or no complaint of pain. A firm compress, filling the orbit was applied and pressure made by a tight bandage. The hemorrhage then ceased and did not again return. The patient made a good recovery; but, of course, with a totally ruined eyeball. She was a woman in apparently good health, about 60 years of age, and of spare habit.

“At that time I had never heard of the occurrence of such an accident, and the moral shock to the operator was consequently scarcely less than to the patient and her friends, great as it was to them.”

Dr. Wm. Thomson also reported a case of similar character.

A CASE OF INTRA-OCULAR HEMORRHAGE AFTER
EXTRACTION OF CATARACT.¹By G. E. DE SCHWEINITZ, M. D.
OF PHILADELPHIA.

CLINICAL PROFESSOR OF OPHTHALMOLOGY, JEFFERSON MEDICAL COLLEGE.

AGNES DONOVAN, aged 65, was admitted to the Ophthalmic wards of the Philadelphia Hospital, June 23, 1892. Her right eye was sightless and shrunken, the result of an injury inflicted many years ago. In the left eye there was a dense nuclear opacity in the crystalline lens, the surrounding portions of this structure being clear and transmitting the red reflex from the fundus oculi. Vision equalled counting fingers. The eyeball was prominent, of the type usually seen in myopic refraction; the anterior chamber deep; the conjunctiva slightly congested, and the anterior perforating vessels more tortuous than is normal.

She was not seen again until nearly one year later, May 15, 1893, when the appearances already described remained unchanged. The general health of the patient was good; there was neither albumin nor sugar in the urine; but the temporal arteries were hard and the pulse characteristic of high arterial tension. On the 17th of the same month preliminary iridectomy was performed—a perfectly smooth operation—and the capsule of the lens stroked with a spatula. There was no complication in the healing.

One month later, June 26, 1893, the entire lens was opaque; the eye was quiet, having, to use Mr. Carter's apt expression, entirely "forgotten the iridectomy;" the iris was mobile, and, so far as loupe examination showed, not atrophic, the light projection perfect, and the tension normal. Extraction was performed by the 3-millimeter flap operation, the knife being entered exactly at the corneo-scleral junction, at the outer extremity of a horizontal line which would pass 3 millimeters below the summit of the cornea. Immediately at the completion of the section, and before the cystotome was used, a bead of vitreous presented in the wound, the crystalline lens being tipped somewhat upward. The cataract was quickly, but with some difficulty, removed with a scoop, its exit being followed by a quick gush of vitreous. For an appreciable length of time there was slight diminution in the tension of the eyeball, followed quickly by a restoration of the tension to the extent of an unusual filling out of the ball. The flap fell nicely into place, the margins of the coloboma were clear, the vitreous ceased to escape and fingers could be counted. The usual light antiseptic dressing was applied, and the patient who had been operated upon in the bed in which she was to remain, was moved to a darkened corner of the ward.

¹ Read before the Section on Ophthalmology of the College of Physicians of Philadelphia.

She complained almost at once of a sickening pain in the back of the head and of nausea. Suspecting that I was in the presence of the gravest of all accidents which may occur after cataract extraction, a hypodermic injection of morphia, $\frac{1}{6}$ of a grain was administered, and the patient's head was raised above the horizontal level to the height of three pillows piled one above the other. In ten minutes, blood began to ooze through the bandages. The dressings were quickly removed and the palpebral fissure found distended with a large blood-clot, while fluid blood flowed freely down the cheek. Remembering the advice of Knapp, the blood-clots were carefully removed, one from its position between the lids and another which protruded through the corneal incision. The conjunctival cul-de-sac, the wound and the surrounding area were carefully cleansed with a solution of bichloride of mercury, 1:5,000, and a full, firm antiseptic dressing was applied. The patient was required to sit bolt upright in the bed, properly supported with pillows. After another $\frac{1}{6}$ of a grain of morphia was administered, the sickening pain in the back of the head disappeared, and she expressed herself as feeling comfortable.

Two hours later I was hastily summoned by the house surgeon with the statement that the bleeding had recommenced. Precisely the same treatment which has been detailed was carried out, although no additional morphia was administered until later in the night, when some return of pain caused the resident surgeon to repeat the dose. At the expiration of twenty-four hours the bandages were removed, and, with the exception of a little blood-staining on the pad next the eye, there had been no renewal of hemorrhage. The cornea was perfectly clear; a blood-clot (which was removed), separated the lips of the wound and partly filled the remains of the anterior chamber; and there was distinct light perception to the lower and outer part of the field.

The subsequent history of this case may be dismissed in a few words: The hemorrhage did not recur, and panophthalmitis did not supervene. Gradually the eyeball has somewhat shrunk, although it still preserves its form, being puckered around the corneal margins. The cornea remains clear, although prominent and small in area, somewhat resembling a pellucid staphyloma, but the faint light perception which lasted for about forty-eight hours, has entirely disappeared and the eye is totally blind.

This, with one exception, is the usual history of these cases, the exception being, to quote the words of Knapp in describing a similar case, that "the dreaded suppuration did not occur." This may be credited to the careful antisepsis which was instituted at once, and which was pursued at each subsequent dressing. The practical deduction, however, is, as has already been pointed out by Knapp, that the advice, at one time prevalent, immediately to enucleate an eye under these circumstances, should not be followed. For example, Trousseau,² reporting the results of 234 cataract extractions, details the loss of one eye from intra-ocular

² Bulletin de la Clinique Nationale Ophthalmologique de la Hospice des Quinze-Vingts, 1892.

hemorrhage beginning five or six hours after the operation. The next day the coagula were removed and the eye dressed antiseptically, and although it atrophied and became sightless, it was satisfactory in appearance.

The hemorrhage, in my case, evidently came from the posterior portion of the eye, and, no doubt, as in other examples, depended upon senile changes in the blood vessels. Ripening the cataract by direct trituration and the necessity of scoop extraction were probably factors of importance in causing this accident, but they alone could not have been responsible in an eye not otherwise predisposed to such an occurrence.

Galezowski,³ describing the advantages of simple extraction, gives a table of 1,934 cases in which he has performed the semi-elliptical section for the extraction of cataract without iridectomy, states that this method never gives rise to hemorrhage, whether in cases of arthritic, gouty or diabetic patients. Intra-ocular hemorrhage, according to him, is to be explained by division of atheromatous vessels in the iris near its ciliary ligament, and hence this accident is not at all to be dreaded in simple extraction, or with sphincterotomy. Inasmuch as we know that vitreous hemorrhage has occurred in simple extraction, and, as in my own case, although there had been an iridectomy, it was a preliminary one and there was no wounding of the vessels of the iris in the section, the proper preventive treatment of intra-ocular hemorrhage after cataract extraction evidently does not alone reside in performing extraction by the uncombined method.

The treatment has been detailed, and the good results, so far as preventing suppuration, have been described. Whether or not—after the premonitory symptoms of intra-ocular hemorrhage have occurred, for example, the pushing forward of a bead of vitreous into the wound, the sudden increase in the tension of the eyeball, the sickening pain in the back of the head, the nausea, and, as in Knapp's case, the vomiting,—actual bleeding can be prevented or checked is very doubtful. Of one thing I am assured—that a hypodermic injection of morphia is indicated,⁴ and I believe, as Jackson has suggested, that the position of the patient is not without effect. While I do not for a moment suppose that anything short of a miracle would have prevented the hemorrhage in the case which I have reported, I regret that I did not place the patient bolt upright at once and not wait until I actually saw the

³ Recueil d'Ophthalmologie, May, 1893,

⁴ Bates suggests full doses of bromide of potash.

blood staining the bandages. Under these circumstances, a hypodermic injection of ergotin has been tried. From the standpoint of the physiological action of drugs it would seem to be a proper therapeutic procedure.

It is hard to obtain an adequate idea of the liability of this accident in cataract extraction as compared with other causes of failure. Thus, Galezowski,⁵ reporting nearly 2,000 cases, has never met a single instance. Knapp, writing in 1890, says: "I have never seen a case, either in my own practice, or in that of anybody. I consider this as a lucky chance, for, according to the usual course of events, I may have two cases next month." What he apprehended, occurred, in part at least, very soon afterward.

⁵ Loc. cit.

DESTRUCTIVE HEMORRHAGE DURING EXTRACTION OF CATARACT.¹

BY S. D. RISLEY, M. D.

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PROFESSOR OF DISEASES OF THE EYE. PHILADELPHIA POLYCLINIC
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ATTENDING SURGEONS AT WILLS EYE
HOSPITAL, PHILADELPHIA.

CATHERINE MALLEY, aged 82. A tall, angular Irish woman, with deep-set eyes, apparently in vigorous health, presented herself for treatment at the Wills Hospital, May 20, 1892.

She had been blind, according to her own statement, for two years. The urine was free from albumin and sugar. Both irides were tremulous and did not react to change of light. The right pupil was slightly larger than the left, and cocaine produced but slight dilation in either. Both lenses were cataractous, and at first appeared to be partially dislocated downwards. More careful study revealed over-ripe cataracts, and numerous glistening, cholesterine-like crystals in the substance of the lens. These were more numerous in the right eye. The apparent displacement was also greater on the right side, but in both eyes seemed due to a sagging downward of the lenticular mass, made possible by a relaxation, rather than a rupture of the suspensory ligament. The lenses had undergone partial liquefaction, affording, in fact, an example of the Morgagnian cataract. A gray-red reflex could be had from the fundus through the upper part of the pupils. Light projection was good in all parts of the field, and light perception normal.

Operation for extraction, May 23, 1892. The patient's head and shoulders were elevated by extra pillows, as she complained that she could not breathe lying flat with a small pillow only, under her head. A perfectly smooth and satisfactory incision, rather smaller than for ordinary simple extraction was made upward in the clear cornea. For a moment after completing the incision the pupil remained circular, but before capsulotomy could be attempted, the patient cried out from sudden and violent pain in the eye and head, which was almost immediately followed by a large prolapse of the iris and a profuse gush of fluid vitreous. The speculum was removed and the upper lid elevated by the finger of an assistant. The wire loop was then introduced and the nucleus of the lens extracted without difficulty and without apparently increasing the loss of vitreous, which indeed was arrested for the time by the presence of the loop. The lids were then

¹Read before the Section on Ophthalmology of the College of Physicians of Philadelphia.

closed, but the violent pain remained and the vitreous continued to flow through the closed lids and was soon followed by a continuous stream of bright red blood. The hemorrhage was so free that the blood ran over the face and down to the pillows. Hot water was freely used, which in some measure, relieved the pain, but had no perceptible influence over the flow of blood. A compress bandage was then firmly applied, a hypodermic injection of morphia administered, and the patient allowed to rest for an hour.

When the compress was removed, the corneal wound was found gaping widely and filled with the prolapsed iris and a large dark blood-clot. Enucleation of the ball was advised after a consultation with Drs. Harlan and Oliver, but to this the patient would not submit. The blood-clot and prolapse of the iris were then excised and the compress bandage again applied. The following day the wound was closed with a puting black mass, and the pupil filled with a dense blood-clot. There was no reaction and the pain had subsided. Two days later the patient insisted upon leaving the hospital against the remonstrance of her friends and the resident surgeons. Some time later I learned that she had died suddenly.

No particulars of her fatal illness were secured, therefore any statement regarding its cause would be merely surmise, unless we reason backward from the brittle condition of the intra-ocular blood vessels to the probability of like conditions existing in the intra-cranial circulation and death from apoplexy.

The liquified state of the cortical, the presence of the cholesterine crystals in the lens, the sagging downward of the lenticular mass, the tremulous irides, and, finally, the very fluid vitreous are all indications of the degenerative processes which had been going on in the eye prior to the opacification of the lens, and naturally led to an unfavorable prognosis before the operation, the correctness of which was only too sadly demonstrated by the unfortunate and painful sequel.

MONOCULAR POLYOPIA. TWO CASES.

By OTTO LANDMAN, M. D.,
OF TOLEDO, OHIO.

THE fact that dissimilar*causes might induce the same effect, is so common in our experiences of consequences, that we may assert as a conclusion, that all cases of monocular polyopia, of course excluding visible peripheral bulbar defects, are not due to one cause. It is impossible, in the midst of medical uncertainties, to make arbitrary and indisputable assertions.

Galezowski inclines to the opinion that the phenomenon of monocular diplopia has its "apparent seat within the eye," and is "certainly due to a spasm of accommodation producing a functional myopia and a secondary diplopia, and, moreover, possessing a hysterical character." Hence, if atropine or glasses be employed to counteract this myopia, the diplopia disappears.

Duret reported a case of monocular diplopia and believes that there was a disassociation of function between the two cerebral hemispheres. The phenomenon followed an injury to the head. One can readily produce a monocular diplopia by glasses placed in varying positions before the eye, and this phenomenon is probably due to an irregular astigmatism which it induces. From this we can understand how the ciliary muscle *might* affect the lens so as to produce two images: but yet, if the patient were sufficiently intelligent, you might elicit an admission that one of the two images was brighter than the other. As we see cases and draw our conclusion, the natural process will be to state the cases and then our deductions.

Case I. L. S., aged 11. History: Had been playing in bed on the morning of October 26, 1891, and falling out of it, struck upon the left side of her forehead. Thereupon she became delirious and continued in this state until Friday. She knew not what had happened. I examined her at her home and found diplopia, and on ophthalmoscopical examination, some anemia of both discs. November 2, convergent strabismus of R. E. Pupil normal, colors normal. R. E. counts fingers in one foot. Hm. + 0.50 Ds., $V=1\frac{6}{8}$. Monocular diplopia, cycloplegia with + 3. Ds., Sn. 1.

L. E., $V=6\frac{6}{9}$, Hm. + 0.50 Ds., $V=1\frac{6}{8}$. Cycloplegia with + 2 Ds., Sn. 0.6 in three inches, contraction of both fields. Ophthalmoscopical appearance normal. Convergent strabismus R. E. Slight in L. E.

November 3,^a B. E. diplopia, fingers in five feet + 0.75 Ds., $V=\frac{6}{18}$. R. E. fingers in eight feet, doubled, Hm. + 0.50 Ds., $V=\frac{6}{36}$. With + 3 Ds., Sn. .08 in three inches. L. E. diplopia, Hm. + 1 Ds., $V=\frac{6}{18}$, with a + 2 Ds., Sn. 1.25 in three inches. Ophthalmoscopic appearance, normal. November 7, R. E. monocular diplopia, Hm. + 0.5 Ds., $V=\frac{6}{36}$. L. E. no diplopia, $\frac{6}{36}$. Hm. + 0.5 Ds., $V=\frac{6}{24}$.

She had been put on alternatives—red iodide of mercury and potassium iodide. She eventually recovered.

Case II. H. II., aged 28. Consulted me January 18, 1893. On December 27, 1892, an electric car ran down his wagon, upsetting same and throwing him upon the pavement, along which he was dragged for a short distance by his horse. His ankle was sprained. When he reached home he was totally deaf. Did not notice squint until a few days after the accident.

R. E., $V=\frac{6}{18}$ + 1.50 Ds., \odot + 0.50 D., cyl. ax. 180° $V=\frac{6}{12}$.

L. E., $V=\frac{6}{8}$. Jr. 1 in six inches, + 0.50 D., cyl. ax. 180° $V=\frac{6}{8}$.

Pupils, fields, colors, and fundi, normal. Diagnosis, cerebral capillary hemorrhage. (Therapy: Potass. iodide and essence of pepsin.) Diplopia and monocular polyopia. Paresis external rectus of left eye.

January 23, sees five images in L. E.; one in R. E.

January 26, sees five images in L. E.; one in R. E.

January 29, sees three images in L. E.; one in R. E.

February 2, sees four images in L. E.; one in R. E.

February 6, right eye has some strabismus internus.

February 13, sees three images with L. E.; one with R. E.

Paresis external rectus of R. E.

February 19, entirely well. R. E., $\frac{6}{12}$, Hm. + 1.50 Ds. L. E., $\frac{6}{8}$, + 0.5 D. cyl. ax. 180° $V=\frac{6}{8}$. B. E. Jr. 1 in six inches.

The above cases are surely not cases of ciliary spasm and apparent myopia, and would not fall, in this respect at least, under Galezowski's category.

From the testimony of the patients it would seem that they did not notice the diplopia immediately after the accident, and yet it might have existed, but in their confusion they may have overlooked it. In both cases there was strabismus internus, and in one case, of both eyes, and monocular diplopia in each. In the other, monocular polyopia in the squinting eye. A careful perusal of obtainable authorities has brought only one fact to light which may serve to make clear and corroborate our idea. Of course, such slight lesions as we have suspected never come to a final determination through a post-mortem. My idea of the cases is that the difficulty was in the visual centers, due to a hemorrhage and clot, which was organized and finally absorbed. Secondly, that the center was subdivided by this act and that it comprehended two or more impressions from one image. The question is whether the physical continuity of a center may be destroyed, with or without destroying its psychical or physiological

power. The removal of a certain area in the posterior lobes produces total blindness; a portion, partial blindness. No particular part of the area need be removed, but a right or left, or superior or inferior piece may be plucked out, and partial blindness follow. The center acts as a whole if there be no break in its continuity.

If a particular area of the brain be stimulated, a certain group of muscles may be thrown into a definite action. If this area be separated by a deep circular incision from its adjacent tissues, and be stimulated, movements identical with the intact area after stimulation, will be evoked. And we may go still further, and can, by such a procedure, separate by a moat, as it were, a center within this center, which will act upon a single muscle out of this group. From this experiment we know that a center can be subdivided.

Defects in almost any portion of the retina may lead to defects in the visual field. "And we may further imagine it, at least, possible that mischief in the brain might be so limited as to produce any of the above partial effects, though the retina, optic nerve and optic tracts all remained intact." Does a center act indissolubly? Can we not conceive of a hemorrhage forming a line of separation and barrier preventing impulses from diffusing themselves; and, hence one center dividing itself into two or more? From the evidence mentioned, we are lead to believe that monocular diplopia may be the result of a lesion separating the visual center within itself and the peripheral impression being one and the central two or more.

ON SOME MODIFICATION OF MY ASTIGMOMETER,
AND ON ITS EFFICIENCY IN THE EXAMINA-
TION FOR ASTIGMATISM.

By F. C. HOTZ, M. D.

PROFESSOR OF OPHTHALMOLOGY, CHICAGO POLICLINIC.

AT the Nashville meeting of the American Medical Association, in May, 1890, I exhibited in the Ophthalmological Section an instrument with which we can easily detect the presence of astigmatism and quickly determine the direction of the principal meridians. The instrument consisted of a small round disc, having a small circular aperture in its center, and another one of the same size near the edge: this disc was attached to the front of a larger square sheet of metal in such a manner that it could revolve about its central aperture. Behind the round disc the metal of the screen was cut out so that when the instrument was placed in front of a window or a gaslight, both holes appeared as luminous points. Just over the peripheric hole, the edge of the rotary disc was drawn out to an arrow point, which, in the revolutions of the disc, traveled along a graduated semi-circle (protractor) and indicated the exact angle of the radius in which the peripheric hole was situated.

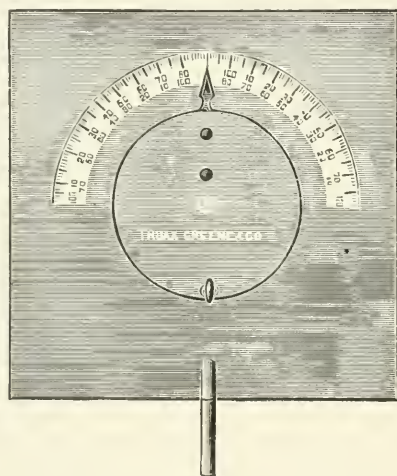
It is a well-known fact that to an astigmatic eye a distant point of light does not appear round, but seems drawn out in the direction of one of the principal meridians. If, therefore, a patient looking at the apertures in the instrument at a distance of fifteen to twenty feet, declares that they appear elongated, we know at once the eye is astigmatic, and we can also easily find the exact direction of the meridians. If the elongation is either vertical or horizontal we know the astigmatism is in the vertical or horizontal meridian. But if the holes appear drawn out in an oblique direction, we have only to rotate the peripheric hole until its long axis appears to the patient in the line of prolongation of the long axis of the central hole: and the degree to which the arrow points, gives us the exact angle of the oblique meridian.

Now, if we imagine a third aperture in the rotary disc situated between the central and peripheric holes, and exactly in the radius

connecting them, this third aperture would appear drawn out in the same direction as the other two, and when the long axes of the central and peripheric holes appear to be parts of a continuous line, the long axis of the intermediate aperture would certainly also lie in that line. But as two holes are sufficient for ascertaining the direction of the astigmatic meridian, I came to the conclusion that we can attain our purpose by the two eccentric holes and might dispense with the central aperture.

This modification offers several advantages. In the first place, it simplifies the construction of the instrument as it does away with the complicated mechanism necessary for revolving a disc on a central aperture.

Secondly, the edges of these eccentric holes can be made very



thin and sharp by beveling the metal on the posterior surface, while the front of the disc is left perfectly even and smooth.

And, thirdly, the two test holes can be placed so much nearer to each other that it becomes much easier for the patient to tell when their long axes are in line. In my improved instrument¹ the rotary disc has a radius of 3.5 cm., the holes have a diameter of 4 mm., and are 1 cm. apart, the outer one being 1 cm. from the edge of the disc. The centers of both holes are situated in the same radius, and at the peripheric end of this radius the edge of the disc is drawn out to a long point which moves over the graduated arc and registers, during the revolutions of the disc, the

¹ Made by Truax, Greene & Co., 75 Wabash avenue, Chicago.

exact position of the radius in which the test holes are situated. A piece of ground glass or mica is slipped over the holes at the posterior surface of the disc in order to diffuse the transmitted light evenly over the apertures and to bring out their contours sharply.

The astigmatic image of the light spots is not always a regular oval, but often it is described as a half-moon or diamond-shaped; or the patient sees a round spot from which a short line of light issues in a certain direction; and, sometimes, he sees each hole double instead of elongated, in which case the position of the secondary hole indicates the direction of the meridian.

In simple astigmatism, the astigmatic effect upon the holes is usually noticed by the unaided eye; but in a number of simple hypermetropic astigmatism of low degrees the elongation of the holes was more decidedly perceived with the convex glass which corrected the hypermetropia of the faulty meridian. In compound and mixed astigmatism the elongation is best brought out by that spherical lens which reduces the refraction of the eye to the condition of a simple astigmatism.

In my former communication I did not give any statistical proofs of the efficiency of this test, but contented myself with saying that I had tried this instrument eighteen years and could vouch for its reliability and practical utility. But such general statements do not give the necessary information to anyone who wishes to compare the relative merits of different instruments used for similar purposes. We can form a correct idea of the efficiency of the instrument only if we know the exact results of the examination in a given number of instances. To furnish these statistical data, my assistant, Dr. L. E. Schwarz, has collected for me from my private records the notes of the last 200 astigmatic eyes which have been tested by my astigmometer; and as it is of particular interest to know how many cases of astigmatism of low degrees there are among the 200, and how often the instrument has succeeded in their detection, Dr. Schwarz has prepared the following table:

DEGREE OF ASTIGMATISM.	Number of Eyes.	Number of Failures.	Percentage of Failures.
Astigmatism of 0.25.....	52	8	15.4
Astigmatism of 0.50.....	83	2	2.4
Astigmatism greater than 0.50.....	65	5	7.7
Total	200	15	7.5

This is certainly a very satisfactory result. An instrument which reveals to us the astigmatism in 92.5% of all cases, and detects the lowest grade in 84.6%, and the next lowest in 97.6%, must commend itself for its great practical usefulness.

It is particularly gratifying to learn that the instrument has shown itself so very reliable in detecting the astigmatism of 0.50 D., because this degree is probably the most frequent source of ocular headache and its prompt recognition, therefore, of the greatest practical importance. One of the two eyes of this group, in which our test failed, had a simple hyperopic astigmatism, but $V.$ was $\frac{2}{7}0$ only; the failure in this case was plainly due to the amblyopia; for in the other eye of the same patient with the same astigmatism, but $V.$ $\frac{2}{3}0$, the astigmatism was promptly revealed by the elongation of the apertures.

To the same cause (the low visual acuity), must be attributed the five failures in the sixty-five cases of higher grades of astigmatism. One eye with hyperopic astigmatism 3.50 D., had $V.$ $\frac{2}{10}0$ only; in two eyes with M 7 D. $V.$ was improved by the addition of -1.50 c from $\frac{2}{7}0$ to $\frac{2}{3}0$; in one eye with mixed astigmatism (M. 2 and H. 1.50) $V.$ $\frac{2}{7}0$; and in one eye with mixed astigmatism (M. 0.50; H. 3) $V.$ $\frac{2}{3}0$. But in this last case, I believe, the failure could have been avoided; for to the other eye of the same patient (which was tested first), the apertures appeared horizontally elongated with -2 D. though its $V.$ was also $\frac{2}{3}0$ only; but its astigmatism was a mixture of M. 2.50 and H. 0.50; and assuming the astigmatism of the other eye to be of the same combination, I tested it for the apertures with -2 D. only, and, of course, failed. If I had repeated the test with weak concave glasses (-0.50 or -1), or with a $+2$, I should have probably succeeded. In all other cases of astigmatism, more than 0.50 D., where the visual acuity was $\frac{2}{3}0$ or better, the astigmatism and its axis was promptly revealed by the astigmometer.

The high percentage of good results shows that this test does not put the powers of observation to a very severe task and that it succeeds with people (children and adults) having only a very modest degree of intelligence.

I find I can more safely rely on it in diagnosing astigmatism than I can on the ophthalmoscope or shadow-test; and I have had no reason to abandon this simple instrument for a costly ophthalmometer. It is true the latter instrument gives us in a certain number of cases the correct degree of astigmatism, but it is equally true that in as many instances it does not give the amount cor-

rectly. Its findings, therefore, cannot be trusted and depended upon in prescribing the correcting lenses; it cannot fill the place of the trial box and test-types. Hence, in refraction work, the ophthalmometer is chiefly employed, (like my astigmometer), for the quick detection of astigmatism and the determination of the meridians; and the facts show that in this respect, my instrument is the more reliable of the two; for if my astigmometer reveals astigmatism in an eye, all other tests confirm the presence of astigmatism; but as the ophthalmometer measures only the corneal curvature, it often finds astigmatism in eyes shown by every other test to be emmetropic, and may find emmetropia in eyes shown by other tests to be astigmatic.

Wurde mann,² for instance, found among 177 astigmatic eyes, fourteen without corneal astigmatism; in these fourteen eyes, therefore, the astigmatism could not have been detected by the ophthalmometer. And Lautenbach, in a recent summary³ of his large experience with the ophthalmometer, says it gives the axis of astigmatism in 88%, while my astigmometer has shown its efficiency in the detection of astigmatism and its meridians in 92.5%. These figures surely offer no reason why I should abandon the well-tried old instrument.

Venetian Building.

²Transactions of the Ophthalmological Section of the American Medical Association, 1892.

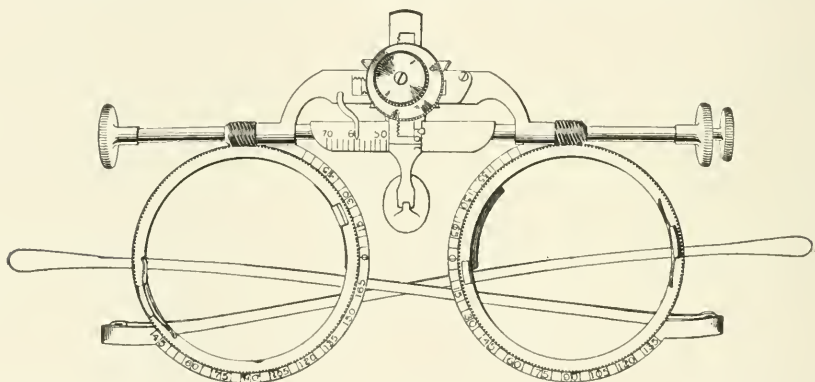
³Ophthalmic Record, December, 1893.

DESCRIPTION OF A NEW TRIAL-FRAME.¹

BY CHARLES A. OLIVER, M. D.

ONE OF THE ATTENDING SURGEONS TO WILLS EYE HOSPITAL; ONE OF THE
OPHTHALMIC SURGEONS TO THE PRESBYTERIAN HOSPITAL; CON-
SULTING OPHTHALMIC SURGEON TO THE MATERNITY
HOSPITAL, PHILADELPHIA, ETC.

THE accompanying wood cut serves to illustrate the general appearance of a test-frame which is intended not only to take the place of the ordinary graduated frame now in common use, but to render that frame lighter in weight, simpler in mechanism, stronger in construction, and to give it greater scope in action. The first three of these improvements have been accomplished by removing all useless and ornamental material from the contrivance, by making all those parts upon which there is no bearing and no strain, of aluminum: and by constructing all of the movable



and adjustable portions of the mechanism of light and delicate pieces of brass and steel. The fourth, which was very imperfectly accomplished in 1878, by Unger, has been obtained by adding a device for the single or combined rotation of such lenses and prisms that require graduated movements to be given to them.

Briefly, the construction of the contrivance is as follows: The main support of the frame consists in a thin, hollow horizontal cylinder of brass, to the front face of which is fastened a narrow inter-pupillary gauge. At the two extremities of this rod there is an encircling narrow band of smooth brass. Arching upwards and

¹ Paper read before the November, 1893, meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia.

inwards from these two bands, there are two flat perforated strips of aluminum which can be made to approach or separate from one another through a small compact wedge of brass, by a very simple, though rapidly moving horizontal rack-and-pinion adjustment, thus giving the necessary movement for the regulation of inter-pupillary distances. The degree of this separation is registered by a small curved pointer that plays in front of the graduated portion of the inter-pupillary gauge.

Running through the standard of the central pinion, which is hollow, there is a finer and smaller pinion that connects with an upright graduated rack. Swinging upon the lower edge of this rack there is an adjustable nose-piece which is so hung as to adapt itself to any form of nasal bridge. Any movement given to this smaller pinion produces a perfect vertical adjustment that denotes the height of the bridge of the nose above the pupillary centers—this being accomplished by means of a small indicator on the front face of the rack.

Curving downwards and inwards from the lower and inner portions of the two excentrically placed bands that hold the upper arch and its racks and pinions in position, there are two fixed rings made sufficiently large to hold the rotating cells for the test-lenses. To the lower face of these two rings there is fastened a graduated semi-circle which can be gauged in accordance with the methods of Knapp and Harlan, or with any of the other plans that are ordinarily employed here in the United States, in Great Britain or in Europe. Enclosed within these graduated circles there are two smoothly-fitting revolving cells which move with the greatest freedom and evenness. The outer peripheries of these two rotating cells are cugged to the greatest nicety and the minutest variation of size that is consistent with surety of action and strength of construction. Each cell is provided with a neat contrivance that is so made and situated that one or two of any of the revolving test-lenses can be conveniently and easily slipped in place or removed at any position in which they may be situated.

Fastened to the posterior faces of the two fixed rings, and in fact, constituting a part of them, there are two broad doubly-grooved hooks² for quickly slipping one or two spherical combinations immediately behind the superimposed cylinder or prism. The temples, which are composed of hardened steel, are made long and broad so as to be very much less likely to slip or slide, are

² Any number of grooves that may be desired can be made in these hooks, thus increasing the holding capacity of the frame.

hinged to the lower outer portions of the fixed rings in such positions as to allow the easiest and most convenient situations for rapid changes of test-lenses.

The cogged brass edges of the revolving cells to be used for rotating the test-lenses, are brought into play by two small similarly threaded heads that play over the horizontal steel rods. These bars which extend for a long distance into the central hollow horizontal cylinder and are capped with small thumb-screws, can, when rotated independently, revolve their respective test-lens cells from either right to left, or left to right.

To save trouble and to avoid either using the left hand or leaning over the patient when the opposite eye is tested,³ the left thumb-screw and screw-bar is perforated so as to allow the entrance of a long, fine rod of brass throughout the length of the central hollow bar and far into the length of the opposite screw-bar. The terminal portion of this penetrating rod is squared throughout the length of its penetration into the opposite screw-bar so as to correspond with a similarly shaped and positioned cavity in this screw-bar. The external ending of this long, fine bar which is thus intended to reach, fix, and revolve the rotating mechanism of the right test-lens cell has a small thumb-screw attachment placed upon it in such a position and of such a size as to be conveniently and rapidly moved, independently or combinedly with its fellow thumb-screw. This independence and doubling of motion of these two thumb-screws permit the revolving cells to move the rotating test-lenses either singly to any desired point to the right or to the left, or doubly to the right, or to the left at any degree of similarity or difference of motion; a plan that is of incalculable advantage in the accurate determination of the axis of astigmatism and the angle of prism-deviation during monocular or binocular action. In addition, there is a series of registration marks upon the front face of the revolving cells by which any degree of vertical or horizontal prism action can be readily or quickly obtained without the employment of any series of prisms. The simple, easily adjusted and smoothly working revolving cells of this frame also gives the contrivance a special value and adaption in the ready employment of the various forms of the Maddox-rod test, etc., for orthophoria.

The construction of the instrument has been entrusted to Mr. William S. Yarnall, No. 1406 Chestnut street, Philadelphia, Pa., U. S. A., of whom samples can be obtained.

³The description reads for the frame as ordinarily constructed, though if desired, the frame can be made with the double-screw attachment placed either upon the right side or upon the left side.

DESCRIPTION OF A NEW OPTOMETER FOR THE CORRECTION OF ASTIGMATISM BY DISTANT TESTS.

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GREAT is the number of *optometers* that have been constructed by different inventors to facilitate the determination of glasses for the correction of ametropia. These instruments may be divided into *two* classes, according as to whether they are simply a convenient collection of lenses that can be brought in front of the eye successively, or whether only a few (2.-4.) lenses are employed which produce by their movement a *continuous* change from one lens to another. The *latter* class comprises the optometers in the strict sense of the word, and are the only ones referred to in this article. In *these* only *spherical* glasses are employed, so that cylindrical lenses can not be determined with them directly, but only indirectly, by ascertaining the different artificial puncta remota for the two principal meridians of the eye. For it is mostly by an *artificial* punctum remotum that the refraction is determined. This, however, leads frequently to very questionable results as *most people, unless under the influence of a mydriatic, are unable to relax their accommodation perfectly, when they observe an object which they know to be only one or two feet off from their eyes.* Furthermore, most optometers make use of a *tubular* arrangement which is also objectionable, as many people feel embarrassed by such an instrument and call their ciliary muscle into activity.¹

¹As Javal (Mémoires d'Ophthalmométrie page xxxvii) says: "Pour l'As, comme pour la réfraction sphérique, la grande difficulté de l'optométrie est de faire relâcher autant que possible l'accommodation. C'est pour ce motif que nous nous méfions avec juste raison de tous les optomètres où il faut, regarder dans un tube, ce qui, pour beaucoup de sujets, est une incitation à mettre l'accommodation en jeu."

In the following lines an instrument will be described which is used for *distant* test-objects as they are now used at twenty or more feet and in which the spheres and cylinders are not enclosed in a tube. The mathematical deduction will be omitted here, but can be easily supplied by any one who has once mastered the famous section 9, of Helmholtz' *Physiologische Optik*.

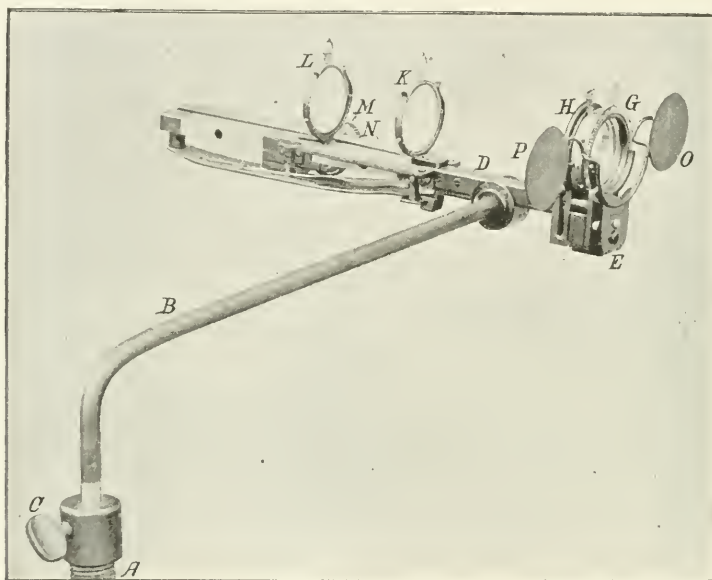
The result upon which the instrument is constructed is the following: If a convex lens of the focal distance f is placed stationary so in front of the eye that the focal point of the glass coincides with the anterior focal point of the eye, about 14 mm. in front of the cornea, and if then a negative lens of exactly the same dioptric value is placed at the distance d in front of the cornea, between the far object and the convex lens, then this combination of lenses is equivalent to a convex lens of $+\frac{f^2}{d}$ focal distance or of $+\frac{1000d}{f^2}$ dioptries placed at the anterior focal point of the eye; at least in so far as the displacement of the *second* principal point of the eye, the value of the two focal distances and the distance of the new second nodal point from the second principal point of the combined system is concerned.² This is a great advantage, as under these circumstances we have *no magnifying action* on the test-letters in axial ametropia, but only the usual change in the retinal images which is necessarily connected with our lenses in the usual position.

² That the combined effect of the two lenses under the conditions mentioned is equal to a new lens of the focal distance $\frac{f^2}{d}$ at the usual position of the glasses can be also easily seen by the following simple consideration: The first negative lens, of course, makes for the positive lens the parallel rays from the distant object appear to come from the focal point of this minus lens. This latter being at d from the convex lens, it is evident that for the convex glass the far object is at $f+d$ in front of it. Further, we know that the distance u of the object from a convex lens and the distance b of the image from this same lens of the focal distance f are in the relation $\frac{1}{b} + \frac{1}{u} = \frac{1}{f}$ from which follows $b = \frac{uf}{u-f}$. Now, in our case the distance of the object u is equal to $f+d$ so that we have $b = \frac{(f+d)f}{f+d-f} = \frac{f^2}{d} + f$. This means that the rays of light from the distant object are made to appear from a point $\frac{f^2}{d} + f$ back of the convex lens or, as this is f in front of the position of the spectacle frame, that the rays of light for our eyes are converging towards a point $\frac{f^2}{d}$ back of us, reckoned from the point just mentioned: quod erat demonstrandum.

In the new instrument a convex lens of $+ 10$ dioptries or $f=100$ mm. is used, so that the dioptric value of the resulting lens $= \frac{1000 \text{ d}}{f^2} = \frac{1000 \text{ d}}{10000} = \frac{\text{d}}{10}$ which shows that for every 10 mm. removal of the negative lens the value of the combination increases by one dioptry. Thus a quarter of a dioptry can be easily read off as it is represented by a space of 2.5 mm. To find then the *positive* lenses, it is only necessary to increase the distance between the two spherical lenses and read off the dioptric value on the scale; but for the determination of *negative* lenses an additional minus-sphere must be used, as will be explained later. With regard to these spheres this optometer rests on the same principle as that of Starr, described in the *New York Medical Journal*, April 6, 1892; but he uses a higher convex lens so that the instrument is less sensitive. Furthermore, he incloses all his lenses in a tube and employs *no cylinders* at all to correct astigmatism.

With regard to these cylinders, which are used in the new optometer, it must be remembered that two crossed cylinders are in general equal to a sphere and a cylinder, an easy method of determining which has been lately given in the October number of the *Archives of Ophthalmology*, 1893. In the present instrument two cylinders of minus 3 dioptries each have been utilized, which give the equivalent of a minus 3 D. sphere alone if their axes are at right angles to each other, and a minus 6 D. cylinder alone if both their axes are parallel; while in all intermediate positions of the axes a sphere varying from minus 3 to 0 dioptries is present together with a cylinder ranging from 0 to minus 6 dioptries. Here then arises the difficulty that together with the cylinders a spherical equivalent is introduced, as is the case in Stoke's lens, where, however, a plus 3 and minus 3 cylinder are used. The present instrument is now thus constructed that while the cylinders rotate equally in opposite directions from a position in which their axes are at right angles to each other to that position in which their axes are parallel, while, therefore, the cylindrical element *increases* from 0 to $- 6$ dioptries and the spherical element *decreases* from $- 3$ to 0 dioptries, *at the same time these spheres are constantly neutralized by a movement of the minus ten D. lens from $+ 3$ to zero.* In this manner nothing but negative cylinders are obtained, ranging from 0 to minus 6 dioptries, while the direction of the axis remains the same throughout the examination. This requires a peculiar mechanical arrangement, because the spheres decrease *equally* by *equal* movements of the minus ten

D. lens while the cylinders increase *equally* only by *different* degrees of rotation for the different dioptric values. Thus, while the sphere decreases from $+3$. to $+2$. by one dioptre. *i. e.*, while the negative lens has to move through one centimeter on the scale, each cylinder has to rotate in an opposite direction by $9^{\circ} 44'$ to get a cylindrical action alone from 0 to minus *one* dioptre. But when the cylinder increases from -5 to -6 dioptries and the sphere decreases from $+1$ to zero D., the minus 10 D. lens has to move again through *one* centimeter as before, while each cylinder has now to rotate through $24^{\circ} 6'$ or twice as quick as before.³



The instrument consists, as the figure shows, of a firm stand which is so constructed that the optometric part can be lowered or raised at *A*, rotated around a *vertical* axis at *C*, and around a horizontal axis at *D*, so that all necessary adjustments can be made to suit the individuality of the patient. *K* represents the $+10$ D. and *L* the -10 D. lens while the two minus 3 dioptic cylinders are to be seen at *G* and *H*. These two lenses, *G* and *H*, are almost in contact with each other and an imaginary plane between them is

³Mr. D. V. Brown, of 740 Sansom street, Philadelphia, was given this idea and calculation, and has succeeded in combining these two movements by means of a specially constructed curve, which works quite satisfactorily. The instrument can be obtained from him.

exactly 10 cm. off from the center of K . Near E is a little adjustable plate that rests against the facial surface of the superior maxillary bone, and must be so arranged that the cornea is about 14 or 15 mm. off from the imaginary plane between the two cylinders G and H . At O and P the two covers are to be seen one of which excludes the eye not examined, from vision.

The optometer is to be used in the following manner: Take out the two cylinders and bring L in contact with K by turning the screw M . Adjust the rest E and let the patient look at the usual test-cards, taking first of all, an *astigmatic* chart. Now separate L from K until everything appears *hazy* and then gradually and slowly bring L nearer to K until *one* set of lines appear perfectly black. Now stop, read off this positive lens on the scale N and put this lens from the test-case in the groove near H . Next bring L in contact with K and put in both cylinders with their axes parallel, and both at right angles to the line most distinctly seen before, e. g. if this clear line was at 75° with their axes at 165° . Now again separate L from K up to $+4$ D. on the scale, and while the patient again looks at the lines, move L further towards K until all the lines appear equally black. Read off this cylinder on the left scale and the case of compound hypermetropic astigmatism is corrected, especially after this correction has been verified again by the test-letters. It need hardly be added that in the case of simple hypermetropic astigmatism, one must proceed in the same way as always $+C.$ cyl. ax. $180^\circ = +C.$ sph. $\ominus -C.$ cyl. ax. $(180^\circ + 90^\circ)$. This will explain the apparent discrepancy of correcting hypermetropic astigmatism by negative cylinders, a method, which alone is used now by Javal, and is certainly the best if no mydriatic can be employed.

If no improvement can be obtained by the method just described and if all lines remain about equally indistinct, then observe at what distance from the patient's eyes ordinary print must be held to be seen distinctly. If this is e. g. 25 cm., then place a minus sphere of slightly shorter focal distance e. g. -5 D. in the groove near H and put L at $+5$ D. distance from K on the right scale. Now, of course, the whole combination after removal of the cylinders is again zero, and while the patient is again directed to look at the astigmatic chart as before, lens L is slowly advanced towards K . As soon as one line appears perfectly distinct, read off the $+$ lens on the right scale and now a minus sphere must be placed in the holder near H , equal to the algebraic sum of the minus lens used at H , and the $+$ lens read off on the scale. Sup-

pose, for example, that with our -5 D. sphere at H we found that we had to move L up to $+1$ to make the first appearing line distinct, then we would have to place a lens in the holder that is $-5 + 1$, which, of course, is -4 . After having taken out the -5 D. lens, and after having replaced it by the new negative lens found before, proceed with the other set of lines in the same way as indicated before in hypermetropic astigmatism. One might say, why not add a minus 10 dioptric lens at H immediately to find the minus sphere necessary for the first meridian. Indeed, this can be done, but then the minus 10 D. lens must be placed accurately at 10 cm. from K and 13-14 mm. off from the patient's cornea, while with the use of lower lenses, one need not be as particular about this. If positive or negative lenses *higher* than 10 dioptries are required, then in the beginning, a plus or minus lens of sufficient strength must be placed in the groove before the instrument is used as indicated above.

This optometer, of course, can be used as an improved Stoke's lens. The latter has never been employed much, certainly for the reason given by Dr. S. M. Burnett in his *Theoretical and Practical Treatise on Astigmatism*, page 33, where he remarks: "It was hoped at one time that this apparatus, on account of its completeness and astigmatic action it was capable of representing, might come into general use in practical ophthalmology. But the combination gives not only a cylindrical action, but also what amounts to a spherical refraction, which constantly varies with the rotation, and must always be taken into account when examinations are made, as they usually are, with parallel rays." The present contrivance does away altogether with this variable spherical element and *gives a purely cylindrical action from zero to six dioptries*.

The advantages claimed for this instrument as an optometer appear to be the following:

1. The instrument is used for *distant* objects, thus *avoiding the tendency to accommodation* so often excited by an artificial punctum remotum.
2. The objects appear of *the same size* as the test-lenses from the trial-case in the usual position make them appear.
3. *No tube* is used that may embarrass the patient and excite his ciliary muscle.
4. It allows to correct astigmatism by the *direct use of cylindrical glasses*, and may also be used as an *improved Stoke's lens*.
5. By using in connection with the *highest +* and the *lowest -* spheres only *negative* cylinders, as is also the practice of Javal, one is more likely to get the *fullest correction for hypermetropia* and to *avoid an over-correction in myopia* in such cases where a mydriatic cannot be employed.

INNERNATIONAL ABNORMALISM THE CAUSE OF
HETEROPHORIA—A NEW METHOD OF TREAT-
MENT OF HETEROPHORIA—A NEW INSTRU-
MENT FOR TESTING ADDUCTION.
ABDUCTION, EXOPHORIA.
AND ESOPHORIA.

BY GEORGE M. GOULD, A. M., M. D.,
OF PHILADELPHIA.

I WISH to call the attention of the readers of the ANNALS to the conception of the innervational origin, explanation, and treatment of heterophoria, and to describe an arrangement of prisms for testing with ease and quickness the degrees of adduction, abduction, exophoria or esophoria that may exist.

In reference to the etiology and treatment of exophoria, I will quote somewhat at length, from a previous article in the *Medical News*, of November 18, 1893:

“It appears to me beyond question that in the vast majority of cases of exophoria, if not in all, the seat of the abnormality is purely, at least primarily, and always principally, central, and innervational. It is not at all a question of tendon-insertions or of muscular strengths. A few of many reasons for so thinking are these:

“*a.* In convergence-adduction, the ‘muscles’ overcoming the maximum of prisms, bases out, that is possible, either internal rectus may be made to greatly increase its contractile power by simply carrying the object to the left or to the right side of the field.

“*b.* Extreme adduction (twenty feet) of exophoric eyes may be doubled, often trebled, in a minute or two by the device of slowly carrying the object gazed at, with weighted convergence-stimulus from the near to the distant point. If, as I said, one can lift with his arms only 200 pounds, one cannot lift 400 or 600 pounds in a minute by any analogous change of the method of lifting,

“*c.* The extreme of primary adduction-power, and even the double of this extreme, may be held continuously for several minutes, even a half-hour or more—I don’t know how much longer.

The extreme lift of other bodily muscles can only be held an instant, and not only this, but constant and uninterrupted tension or contraction of such muscles in lifting even very small weights is impossible.

“*d.* Besides all this, such constant tension, when solely muscular, is painful, even agonizing, if demanded by the will or by necessity. In the case of exophoria, the extreme of prisms, and even the double of the extreme, bases out, that can at first be held without diplopia, is in a minute or two continuously held without the faintest suggestion of pain or even of discomfort.

“*e.* Muscular tissue, as such, cannot be made to double or treble its volume or its strength in a few hours or days, or even in a few weeks, but such increase of ocular adduction-power I see many times every day.

“There are many other such considerations, too numerous to mention, all running to prove the same conclusions.

“If, therefore, the seat of the difficulty lies in the innervational centers and co-ordinations, the treatment by tenotomy, or by gymnastic exercises (with weak prisms), seems to fall to the ground. We must instead seek to normalize innervation, leaving the muscles and tendons entirely out of the count. In accordance with this I have sought to break up the bad habit of exophorial innervation, to re-establish normality in an erroneous nervous co-ordination, to heighten convergence-stimulus, and to carry this increased stimulus as well as the naturally heightened stimulus of convergence at near range, into distant and all-around seeing.

“The method I suggest for effecting this normalization of innervation and co-ordination in exophoria is by what I have called ‘the weighted convergence-stimulus carried from the near point to the distant point.’ In the great majority of cases of subnormal adducting power. I find that the ‘weighting’ or ‘handicapping’ by prisms, bases out, is at first about double the primary twenty-foot adduction-power. That is, if the patient has only 10° of such adduction-power, we may at first safely give 20° prisms (total) as the handicap, then slowly carry the object gazed at fixedly and continuously from the near point to the distant point. This is to be repeated until the eyes with 20° prisms can hold objects all about the room easily. The repetition is to continue several times daily until this increased adduction-power *is habitual*, and until no diplopia is produced on first adjusting the prism-fronts (or, better, prism-spectacles) and looking at distant objects immediately, and without the device of carrying the object from the near point to the

distant-point. When this condition has been reached, the strength of the 'handicap-prisms' is to be increased say, to 25° or to 30° , and the method resumed as before. Before an adduction-power of 30° has been reached the symptoms of asthenopia will long have vanished, but the manifest, or the latent exophoria, will still usually, and to some degree, be present. The treatment from 30° to 40° prisms should be continued until all manifest and latent exophoria has disappeared, and 2° of esophoria have become manifest.

"These, of course, are rough and indefinite rules, drawn from my short experience with the method, and they will require adaptation to the peculiarities of each case. Some patients have far greater reaction-power than others, both as to the amount of the 'weighting' of the convergence-stimulus permissible or required, and as to the rapidity of the return of normalization of innervation. But in all cases, so soon as increase of the adduction-power has become stronger and habitual, we should weight the convergence-stimulus with still stronger prisms, so that effort and the device of slow recession of the object gazed at are (at first) required to avoid diplopia on looking at distant objects."

As to esophoria, the exact reverse of the plan, so far as the details of method go, readily suggests itself, though identically the same principle underlies both. In exophoria, if we proceed sensibly and physiologically, we do not want to weaken the not-over-strong abduction-power, but we wish to strengthen the subnormal adduction-power. So in esophoria the adduction-power is not too strong, and the problem is to develop the weak power of abduction.

Prisms, bases in, are therefore placed in the trial frame, the full number of degrees that can be overcome at the extreme of convergence and accommodation. (The ametropic defect is, of course, first corrected in all cases). The object is then brought from beyond the point of fusion-possibility and toward the extreme punctum proximum. As the power of fusion or abduction increases, higher degrees of prisms, bases in, must be worn during the periods of innervation-exercises, until there is normality of twenty feet abduction-power. The length of the exercise periods must be left to the judgment of the oculist as every case is a law unto itself, and particularly so in these departments. But as in exophoria, so in esophoria, there is by no means so much tiring as would be expected, and no pain or even discomfort attends quite protracted exercise. I find it wise to begin with periods of a few minutes each in duration (reading moderately fine print, varied with exer-

cises in bringing appropriately sized test letters from *beyond* the point of fusion to a position *within* the point of fusion), and six to twelve exercises a day.

In hyperphoria, it is plain that we should seek to weight the convergence-stimulus with prisms up to the extreme power of fusion at the near point, the placing of the prisms being such as to develop the weaker function, and the object being held horizontal with the eye. Then, the head being kept rigid, the object at the near point should be slowly carried upward and downward, the gaze being kept riveted upon it until the full sweep of the eyes upward and downward can be carried out without diplopia. The length of the periods of exercise will be dictated by good judgment, as also the strengths of the prisms used. The approximation to orthophoria is, of course, followed with increase of prism strengths.

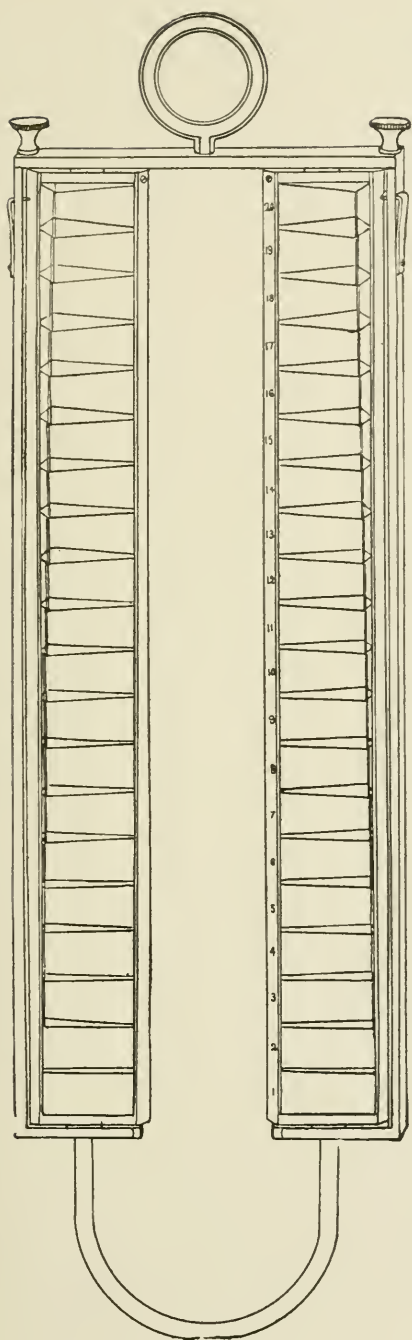
A highly important condition of success in all these exercises is the arousing of latent innervational power by the will and effort of the patient. To this end constant encouragement and command is necessary that the patient shall look "hard," "fiercely," "scowlingly," riveting the gaze upon the object with the full power of the will. The "scowl" is especially a powerful aid. Physiologic function, and even organs themselves in the long run, are the products of desire, effort, repetition and habit.

In exophoria I have had the most gratifying success in curing a large number of cases. I have yet to meet a single case of failure.

The permanency of the cure has been questioned. I have re-examined perhaps a dozen cases after two, three, or four months had elapsed, and I have not found an instance of any weakening of the normal adduction-power once regained, nor of any tendency to the return of exophoria.

In esophoria and in hyperphoria, every case I have seen reacts to the treatment, but such cases* are comparatively few, and my experience is, as yet, too limited to report results, or to be firm in my therapeutic conclusions. I have briefly epitomized the plan of treatment I have adopted in such cases in order that others who have written me enthusiastically of their results by the plan advised in exophoria, may also experiment upon these other forms of heterophoria at the same time with myself.

In testing exophoria and esophoria, and the power of adduction or of abduction, I have found the common methods in use both time-wasting and vexatious, and have suggested to the opticians, Messrs. Wall & Ochs, 1702 Chestnut St., Philadelphia, that a double series, "battery" or "pile" of prisms would be of service. The illustration given herewith is the result of our mutual efforts, and after thoroughly testing the instrument I commend it as mechanically



beautifully made, and scientifically admirably effective and convenient. The prisms begin with 1° lenses upon each side and increase by integers to 20°, so that with 2° steps one may test all degrees of adduction or of abduction from 2° to 40°. The open central space permits the lenses to be brought close to the eyes without any interference with the patient's nose. The larger handle below allows the first tests to be made with the lower-power prisms, likewise without the handle striking the nose. The lower-power prisms are placed below in order that in testing from low powers to higher powers, the breath of the patient may not cloud the lenses to be used next in order. To test adduction each "battery" is placed "bases out;" to test abduction, each is revolved so that the bases are "in." To test exophoria and esophoria, the same methods are pursued, the maddox-rod (*red*) being first placed before one eye in the trial-frames. Each battery is revolved at pleasure, being fixed by a pivot-mechanism below and above, and temporarily held in the position desired by clutches at the sides. By this mechanism the four tests desired may be made with great celerity and ease. The instrument may also be used for short periods of exercise in adduction and abduction. The illustration is one-half size.

SOME AIDS TO ACCURACY IN THE CORRECTION OF
ASTIGMATISM, WITH A CUT OF A TRIPLE
TRIAL CYLINDER, AND ONE OF AN
AXIS-INDICATOR.

BY ARTHUR E. PRINCE, M. D., PH. D.,
OF SPRINGFIELD, ILL.

PROGRESSION in ophthalmology is marked by a growing tendency to take account of small errors, and especially those of asymmetrical refraction.

Comparatively a few years ago, the weakest cylindrical lens in the trial case was one-sixtieth, and an error of less amount was regarded as normal. With the adoption of the metric method of denoting lenses, 0.25 became the minimum, but was relatively seldom prescribed until within the past five years. Dr. Chisolm's paper on the value of the 0.25 cylinder, read before the Ophthalmological Section of the American Medical Association, in 1879, did much to popularize the use of the fourth dioptré. Since that time account has been taken of intermediate degrees, and the 0.12 C., 0.37 C., and 0.62 C., are found in every complete case.

With this refinement in the refracting quality an equal demand is made for precision in the location of the axis. This is made manifest by the continuous efforts to perfect the trial frame. The weight of most complicated frames makes them more or less unsatisfactory. There is, besides, the frequency of asymmetry of the face and location of the ears, which demands constant watchfulness, lest the consequent malposition of the frame on the face will vitiate the reading of the angle on the graduated margin.

It is my belief that a gain in accuracy, as well as in comfort, would result from the abandonment of the heavy graduated trial frames with revolving cells which accompanies every trial case.

About ten years ago I discarded the revolving cell upon the discovery that by mounting the axis at an angle of forty-five degrees, the lens could be rotated in a light, simple cell, and made to assume any given angle. This idea I communicated to the Geneva

Optical Company, and to F. A. Hardy & Co., who adopted this method of mounting cylinders, since which time it has become almost universal.

In a recent interview with Dr. Jackson, of Philadelphia, I was gratified to learn that he had abandoned the graduated frame, and adopted an ingenious and exceedingly simple device for determining the degree of inclination of the trial cylinder. The frame employed is of flexible wire, so that it may be easily conformed to rest horizontally before the eyes. The most acceptable axis having been found, the frame is removed from the face, and the center of each cylinder is placed in turn over the center of a graduated circle of about six centimeters radius, the axis being parallel to the horizontal diameter. The point of the circle at the intersection of an imaginary line through the centers of the lenses indicates the exact inclination of the cylinder axis. The upper semi-circle is graduated from right to left, and the lower from left to right.

It has been my practice to superpose the center of the cylinder over a small graduated circle, and select the radius which corresponds with the axis.

In the application of either of these methods, the frame must rest horizontally, and it must be removed from the face and applied over a diagram. To avoid this inconvenience and possible source of error, the thought occurred to me some time since, of suspending a protractor from a pivot, through a delicate rod, in such a manner that any given inclination of the rod would be indicated by the corresponding division on the protractor.

A rough model was made, and its usefulness was found more extensive than was at first imagined.

Not only was it found convenient to determine the inclination of a trial cylinder, but was equally efficient in determining the axis of a mounted cylinder, the location of which may have been determined by either of the various methods.

It may also be found useful in connection with retinoscopy.

The observer sees in the patient's eye the band of light corresponding to the axis. With most persons, when this is horizontal or vertical, no question arises regarding its position; but when it is inclined, few will agree upon the degree of the inclination.

A convenient method of locating it is to place in the frame a trial cell across which is drawn a distinct line, which, by rotation, is rendered apparently parallel to the shadow-reflex. Those who are not deterred by the inaccuracies of the graduated frame may be satisfied with noting the corresponding angle on the margin.

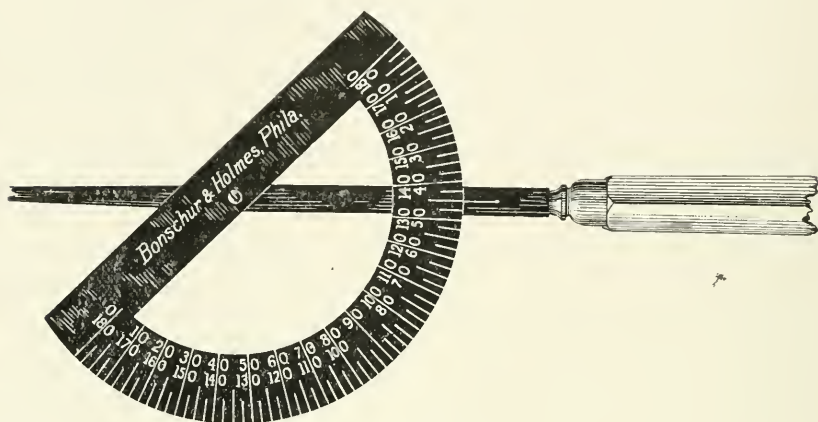
More accuracy and expedition, however, are obtained by placing the rod so that it may be seen parallel to the shadow, and reading the angle of inclination on the margin of the protractor.

This axis indicator, of which the accompanying cut has been furnished by Bonschur & Holmes, of Philadelphia, may be christened an "*astig-goniometer*" which may dignify its journey to oblivion after it has been superseded by a superior instrument:

PRISOPTOMETER.

Here I desire to express my appreciation of Dr. Culbertson's contribution to ophthalmology, viz: *The Prisoptometer*.

It is thought to be superior to the Snellen fan and to those instru-



(FIG. 1.)

NOTE:—In the construction of the above instrument the outer numbering is omitted, and the superior horizontal line is broken by an arc to receive the pressure of the thumb or fingers to prevent further motion, in case the rod is held in the pendant position.

ments which depend for their results on the distortion of a small illuminated light source, the best of which is Hotz's Astigmometer. In the presence of small errors, the answers of the patients are not usually reliable. Small images, besides, are distorted by minute defects in curvature which do not correspond to the general curvature of the cornea. The prisoptometer test object is so large that the images are proportionately less distorted by minute imperfections of transparency or curvature. Besides, the relatively small aperture excludes all peripheral imperfections of the cornea, even though a mydriatic may have been employed. To these facts is due the superiority of the instrument in the presence of irregular astigmatism and partial opacity of the dioptric media which preclude

the employment of objective methods. The fact, that the only answer required relates to the exact touching of the two circles, makes the instrument especially available when a subjective test is deemed desirable in the examination of children, the stupid, ignorant, amblyopic, and deaf and dumb.

The readiness with which one rotation of the prism will indicate the character of the astigmatism, whether simple or compound, hypermetropic, myopic or mixed, with or against the rule, and its relation to hypermetropia, or myopia, makes it a great time-saver for the busy practitioner.

The main objection to the instrument is the necessity for centering the eye behind the divided prism, and the absence of any provision to secure this object. If accurately centered, the *manifest* error, when of moderate degree, may be accurately measured, but a lateral motion of the head causes an apparent error.

This objection would have doubtless been overcome, had not the application of the divided prism to ametrometry been covered by a patent, which has caused it to remain without improvement in its present crude state, without head rest, centering arrangement, or combination of lenses, by the addition of which it is to be expected the instrument will be improved after the restriction has expired by the fifteen year limitation.

TRIAL TESTS.

The oldest, and still when available, the ultimate test, whether subjective or objective, is the test of vision obtained by a comparative trial of various spherical and cylindrical lenses. To curtail the consumption of time and exhaustion of patience attendant on the random pursuance of this method, Dr. Jackson, in the *Ophthalmic Record*, has suggested the use of a plus cylinder crossed on a corresponding minus cylinder. The conceived advantage of this combination arises from the simultaneous modification of both meridians, thus deriving an indication relative to the change desirable in both cylinder and sphere.

The operation of the crossed cylinder may be shown by the following example:

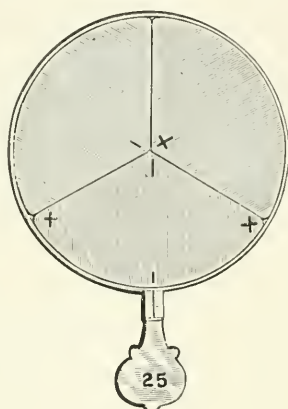
Assume the refraction to be $+ 1.00$ S., $+ 0.50$ C. 90° . The spherical which will be preferred will be that which will correct half of the cylindrical error, viz: $+ 1.25$, leaving uncorrected $+ 0.25$ C. $90^\circ \odot 0.25$ C. 180° . The effect of the crossed cylinder 0.25 C. $90^\circ - .25$ C. 180° will be more apparent than either the 0.25 cylinder or the 0.50 C. with axis held before either meridian. The indications, however, derived from this test, regarding

changes to be made in the combination before the eye, are not so accurate as those obtained by the presentation of the axis of the plus and minus cylinders successively before each principal meridian.

The principal objection to this latter method arises from the inconvenience of handling a variety of lenses so as to bring them in the desired succession rapidly before the eye.

This view gave rise to the conception of combining three cylinders in the trial frame, after the manner of constructing the perfection bifocal, and such a Triple Trial Cylinder was made for me by F. A. Hardy, of Chicago.

The shape of the lenses has since been changed, making the elements equilateral as shown in the cut, (Fig. 2).



(FIG. 2.)

The axis of the simple cylinders are so mounted that either, by the rotation of the handle, may be alternately presented before each principal meridian or before the axis of the cylinder which may be in the trial frame.

Credit is due to the manufacturer for his suggestions relative to indicating the axis of each element in the combination, by making the junction angle correspond with the axis of each cylinder in the combination, and indicating the strength on the handle. The practical application of this combined cylinder may be illustrated by an hypothetical case. Before the eye place $+ 1.00$ S. $+ 0.50$ C. 90° . Each cylinder is now rotated before either principal meridian: Minus 0.25 C. 90° is accepted, but $+ 0.25$ C. 180° is preferred. This would indicate an increase in the strength of sphere, and a reduction in the refraction of the cylinder. Make this spherical change and repeat the observation. Minus 0.25 C. 90°

is now preferred, indicating $+ 1.25$ S. $+ .25$ C. 00° . Preference over nothing is now shown for neither $+ 0.25$ C. 180° nor 0.25 C. 180° , but $+ 0.25$ C. 90° is preferred over $- 0.25$ C. 90° , indicating an increase of less than 0.25 C. in the vertical meridian. Hence the correction would be $+ 1.25$ S. $+ .37$ C. 90° .

From the above it is observed: First, that a comparison of minus and plus cylinders with axes corresponding to that of the trial cylinder before the eyes will furnish a guide relative to changes in the strength of the cylinder. Second, a comparison with the axes crossed before that of the cylinder in the combination will serve as a guide relative to modifying the spherical as well.

The event in which a guide toward the correct modification is not rendered by the above comparison is that of a spherical error remaining after the cylindrical correction is final. This final test must be made with a sphere, in accordance with which fact the suggestion is made for a Triple Trial Sphere, consisting of $+ 0.25$ S., $- 0.25$ S., and $- 0.12$ S.

In the lens, illustrated in the cut, the crossed cylinder has been given a position in the combination in order that any advantage it may have may be more readily established, but thus far I am inclined to place a superior estimate on the co-apposition of the plus and minus cylinder in the combination, and favor the reduction of the size to a quadrant and the substitution of a plus and a minus sphere for the crossed cylinder.

It is believed that such a lens, made in various strengths, will prove an acceptable substitute for both the Triple Cylinder and Sphere, which have been found such an aid as to entitle them to a place in every trial case.

OBJECTIVE METHOD.

Even with the greatest care, the subjective methods, not infrequently, lead to error, and a certain amount of insecurity is always experienced unless the result be corroborated by an objective examination.

The keratometer of Helmholtz laid the corner stone, and this, simplified by Javal and Schiötz, has placed in the hands of the ophthalmologist an instrument, which, within its proper sphere, for mathematical precision and facility of employment, leaves little to be desired.

It is, however, to be borne in mind that it is a keratometer and not an ophthalmometer. It is a source of regret that so many false claims have been set up by ardent enthusiasts. The more conservative, doubtless among whom is Helmholtz himself, recognize

the fact that astigmatism is often lenticular. Indeed, the first case ever recorded, viz: that of Mr. Young, discovered in his own eye, and reported in the Transactions of the Philological Society, London, 1801, was largely lenticular. The axis¹ was determined and the degree measured by means of fine wires, and the influence of the cornea excluded by immersing the eye in water.

It is, however, a coincidence of great physiological convenience that the principal meridians of the lens, and those of the anterior surface of the cornea, usually correspond, so that the influence of the lens in determining the axis of the astigmatism in but a minority of instances vitiates the reading of the keratometer.

If the observations of Lautenbach (*Ophthalmic Record*, December, 1893) be correct, we are to expect a failure on the part of the ophthalmometer to determine the axis with precision in but twelve per cent of the cases examined. According to the same observer, the reading of the keratometer corresponds in degree with that determined under a mydriatic (after making the correction of 0.37 D., subtracting it when the astigmatism was with the rule, and adding it when it was against the rule), in but forty-five per cent of the eyes examined. The following mechanical dangers against which one should be guarded are noted:

“A malposition or displacement of the Wallaston prism is frequent. Instead of the primary image revolving about its center with the revolution of the prism, it has in addition another motion about an imaginary center, the secondary image in either case moving about the primary one. If the arc be not in proper position, again are the results valueless.”

Finally, it seems almost needless to mention the malposition of the head, and the direction of the eye as a possible source of error. The instrument furnishes no means by which the observer may know the influence of the other refracting surfaces, hence it cannot be relied upon unaided by other methods, but is, nevertheless, taken in conjunction with other means, a decided aid to accurate diagnosis in all otherwise doubtful cases.

SKIASCOPY.

The only objective method which takes into consideration all the media of the eye and lays any claim to accuracy, as understood at the present day, is the “shadow test,” skiascopy, or more familiarly, retinoscopy.

In the days when accuracy in the determination of astigmatism was limited by 0.50 C. or 1.00 S., the ophthalmoscope was an available diagnostic aid, but in comparison with skiascopy it merits no longer a primary position.

Though the fact, that the axis of astigmatism could be demonstrated by the plain mirror, was known to William Bowman previous to 1864, the knowledge had no practical value until after 1873, when Cuignet demonstrated the philosophy of the shadow movements.

In the employment of the method, the requisites of accuracy are a dark room, proper illumination, a regular cornea, transparent media and cycloplegia. Given these, an appropriate instrument, and a certain degree of skill, the method fills a want not otherwise supplied.

It locates the axis in small degrees of error, determines with accuracy the nature and quantity of the cylindrical error, and with almost the same degree of precision the spherical error with which it may be associated.

Regarding the employment of the method, differences in details are numerous. Some prefer a large, while others, including Jackson and Thorington, advocate a small mirror. In certain schools the concave mirror has the preference; in others it is almost excluded in favor of the plane. One writer advocates a perforation; others regard the most valuable portion of the mirror lost by its perforation. Some confine their observations to within a distance of one meter; others find the greatest delicacy in the long range of from three to six inches. With some, the variable point of observation constitutes its delicacy; others preserve a fixed distance and modulate the effect wholly by means of trial lenses. By some, each principal meridian is corrected separately by means of spherical lenses; by others the astigmatism is estimated by means of cylinders. The source of illumination varies between an uncovered Argand burner and a small circular aperture in an opaque shield. Difference of opinion exists as to whether the source of illumination shall be back of the patient's head or approximated to the eye of the observer.

With these numerous points at issue, the liberty is taken of giving special mention to the method as employed in Wills Ophthalmic Hospital where sufficiently accurate results are attained to entitle retinoscopy to a consideration under the above title.

The room is as dark as it can conveniently be made. The Argand burner is screened, except at a perforation one centimeter in diameter, to furnish illumination (the Wellsbach burner is still better).

The skiascope preferred is that of Thorington, and consists of a small, plain imperforate mirror 18 mm. in diameter, with central

transparent area. The observer places his eye about twenty-five centimeters from the aperture and reflects the light onto the eye of the patient situated just one meter distant. If astigmatism is present, the rotation of the mirror about various axes will cause the shadow to appear, which will be most distinct in the axis of one principal meridian. With the proper correction of one dioptré for the distance of one meter, the spherical lens required to neutralize the motion in each of the principal meridians will represent the astigmatism, which result may also be verified by means of cylinders used in conjunction with the correcting sphericals.

While it is usually possible to locate the meridian by the inclination of the light band as seen in the pupillary area, it has not been found easy to determine the exact angle of inclination. To this end I trust that the foregoing astig-goniometer may serve a useful purpose.

THE TREATMENT OF INTERNAL SQUINT.

BY HOWARD F. HANSELL, M. D.

OF PHILADELPHIA.

DONDERS promulgated, many years ago, a theory in explanation of internal squint, which has been accepted by students of ophthalmology. The treatment indicated by him has been universally followed, with varying degrees of success. Since, in hypermetropia, good acuity of vision is obtained only by abnormal stimulation of accommodation, and since excessive ciliary contraction necessarily induces excessive convergence, convergent squint is caused by hypermetropia. (Donders). The reasoning is physiological. The exceptions to this doctrine are, however, so numerous that we are forced to look for other causes. For example, Donder's theory will not explain convergent squint in emmetropia and myopia; it will not explain why squint is not found in all cases of hypermetropia; it will not explain that, in some cases, either eye is used in fixation, and in others, always the same one; it will not explain amblyopia. If we accept this theory of causation, the treatment becomes uniform, and the prognosis good in all cases. The necessity for ciliary cramp is obviated by a correction of hypermetropia, and the stimulus to excessive convergence is removed. In practice, we find a comparatively small proportion of internal squints (25%) obtain binocular fixation for all distances as a result of attention directed to hypermetropia and convergence alone. Schneller, (*Archiv. f. Ophth.* Bd. 36, Pt. III), says: "In order that true squint shall be induced out of strong adduction, caused by disproportionately great accommodation, other agents must co-operate. First, the value of binocular vision must be reduced, since single vision hinders squint. Second, the existence of qualities favoring convergence, such as a small angle alpha, and build and innervation of the eye muscles." He concludes his elaborate article, "A Contribution to the Theory of Squint" by an enumeration of causes: first, innervation; second, the nature of the muscles subject to the innervation; third, anomalous accommodation; fourth, opposing forces, such as the elasticity of the

muscles, the relation of their diameters to the position of the point of rotation, the length of the eyes, their position in the orbits and their inclination to the middle axes.

All cases of functional internal squint are simple or compound, uncomplicated or complicated. The simple includes those cases to which the axes of vision deviate from equilibrium laterally only, in which binocular vision can be secured and maintained by correction of the error of refraction and tenotomy. In other words, the dynamic apparatus is not prevented by organic deficiencies from responding to the effort at fusion. The compound includes those cases in which an organic change—in the muscles or their tendinous insertions, in the optic nerve, retina or cerebral centers, or in the form of the ball—will preclude binocular vision.

Whatever may be the true theory of internal squint, whether it be pure innervation, or whether it be abnormal response to the innervation, it is essential to the cure that the relative positions assumed by the eyeballs, in near and distant vision, should be investigated. Accurate information cannot be obtained by an objective study of the balls themselves, but only by an analysis of the false and true images in their relations to one another. Hence, instruments for the diagnosis of the degree of squint, which have as their basis a comparison of the situation on the straight and on the deflected cornea of the reflection of a bright object, are manifestly inferior to the simpler method of compelling the patient to recognize a false and a true image of a candle flame at various distances. False projection and false answers may lead to confusion, but only in exceptionable instances.

First, simple, uncomplicated squint. The patient fixes the candle light with either eye indifferently since the cause of the abnormal convergence lies in the innervation. There is no amblyopia. The error of refraction may be high or low, but the difference between the two eyes does not exceed 3-4 D. The false and true images are on one horizontal plane. At 6 m. the space between the lights varies in the same individual at different times, averaging, perhaps, 1 m. Should the patient refuse to acknowledge the two lights, as is usually the case, for diplopia is never a complaint of functional squint, glasses of different colors, red and dark blue for example, held in the spectacle frame before the eyes, will invariably solve the difficulty after a few trials. Correction of the optical defect relieving all extraordinary strain on the accommodation, will, in the cases in which the squint has not become habitual, when constantly worn, suffice to effect a cure.

In the large proportion of cases, tenotomy must be made. It must be borne in mind that convergent strabismus is, in all functional cases, an affair of two eyes. It does not concern either internal rectus alone, hence both muscles should be tenotomized in as nearly as possible equal degree, either at the same or different sittings, preferably the former. Having obtained by these means binocular vision, no anxiety need be felt as to the final and permanent result, for now, under the altered circumstances of physiologically responsive muscles, normal innervation will produce normal results, and fusion force will maintain binocular fixation.

Second, compound or complicated squint. Upward or downward deviation of the visual lines. The innervation theory is accepted as sufficiently explanatory of functional, simple convergent squint as described above. It is equally applicable, when other than the interni are functionally innervated beyond the normal limit of equilibrium. If internal strabismus depends upon excessive contraction of the interni, induced by the necessary effort of the ciliary muscle to overcome hypermetropia through their innervation by the motor oculi, it is logical to presume a relatively equal overaction of all the muscles supplied by that nerve. If, now, for any reason, one or more of these muscles responds to the stimulus by super or subnormal contraction, the result must be a disturbance of vertical equilibrium through a rotation of one or both balls. Such reasons may be purely mechanical, such as unsymmetrical positions of the globes in the orbits; or anatomical, such as an inequality in the centers of rotation from a longer or shorter antero-posterior diameter, or muscular from anomalies of accommodation, length, diameters and attachments of the external muscles, or of the axes of the orbits. It is illogical to assume that the four lateral muscles alone will be disturbed in their equilibrium, and that four vertical and two oblique will contemporaneously maintain their balance. To the observer, the most apparent defect is an inward rotation of the cornea, readily explained by the relatively greater power of the interni. By prism measurement the interni overcomes 25° — 50° or even more at 6 m., while at the same distance the elevators and depressors can fuse images through only 3° — 4° . Hence, an upward or downward deviation of 2° — 3° , angular measurement, very important in its effects, can be observed only with the greatest difficulty or perhaps will escape notice, while a relatively equal convergence produces a deformity, noticeable at a glance. A vertical insufficiency, great enough to vitiate any attempt at operative correction, will invariably be over-

looked if the means of diagnosis are confined to objective methods. Therefore a correct diagnosis of muscular anomalies can be reached only through study of the double images. I here take the opportunity to emphasize the absolute necessity of this indispensable aid to accurate diagnosis, and to assert that by this means alone can we arrive at a successful issue by operative treatment. Moreover, the utmost capability of vision of each eye must be developed by repeated trial with the test lenses. A proportion of cases of so-called amblyopia may be taken out of that category and placed among useful eyes by careful attention to spherical, and particularly cylindrical, defects. Through the glasses which give most rest to the accommodation and the best acuity of vision, the tests for diplopia must be made. Recognition of the false image will be facilitated if the true image be made indistinct by means of a dark blue glass, or if a strong prism, with its base out, be placed before the squinting eye in order to bring the object to be seen by that eye into the neighborhood of the true image. A patient may refuse to confess a false image when the displacement is great. In the majority of complicated squints, vision differs materially in the two eyes. In the good eye, it is usually $\frac{6}{12}$ or better, and in the bad, $\frac{6}{60}$ or worse, and the squint is constant, the better eye being used for fixation, while the worse bears the total super-normal convergence. But we must not be misled by this condition into supposing that we have to deal with a monocular defect, and thus direct our treatment to the deflected eye only, since in all cases that belong to the innervation theory—absence of anatomical changes—the squint will either entirely disappear or be transferred to the fixing eye, under conditions of general muscular rest, ether narcosis, sleep, or death, so that the word “constant” as applied to this form of squint is not strictly accurate. The squint is constant only when the eyes are functioning.

In simple convergent strabismus, the true and false image are in the same horizontal plane. (This statement is not strictly true in high degrees of squint when the lights are separated by a wide interval. Here there may be an inconsiderable vertical displacement, and perhaps tilting of the false image, owing either to an inclination of the patient's head or the unopposed action of the inferior oblique muscles). If, however, the two horizontal planes are separated by a vertical interval of an inch or more at 6 m. we must recognize the vertical deviation of the optic axes as an important factor in the treatment. It teaches us that there is more to consider than excessive convergence. We admit the relation be-

tween the ciliary and the interni; must we not admit a similar causative relation between the ciliary and *all* the muscles stimulated by the efferent impulse through the motor oculi? Thus are involved the superior and inferior rectus and the inferior oblique. The impulse to abnormal convergence is responded to in all cases by one internal rectus in order that one eye may be used in fixation. For the same reason, the impulse to vertical deviation must stimulate one set of elevators or depressors. Since elevation of the cornea is under the control of the superior rectus and inferior oblique, and depression, of the inferior rectus and superior oblique, we should, logically, expect to find the squinting eye deviating upward, since the elevators receive the greater impulse. This is the actual condition in the majority of cases of compound strabismus or heterophoria.

A second complication is amblyopia. Our knowledge of amblyopia is purely speculative. We recognize it by its negative qualities. In a paper on "An Analysis of Fifty Successive Cases of Squint," read before the Ophthalmological Section of the Pan-American Congress, I presented the following conclusions:

"1. That congenital amblyopia is almost uniformly present in constant internal squint.

"2. Amblyopia is not essential to squint, either constant or alternating.

"3. Amblyopia is found in hypermetropia without squint.

"4. Amblyopia is not a condition of alternating squint.

"5. Amblyopia precedes the appearance of squint and is not a result of non-use."

If we accept these conclusions we are compelled to believe that amblyopia is a positive element in producing squint, and in determining the squinting eye, and that it has an important bearing on the prognosis. We can seldom look for binocular fixation from operation, since an essential factor in maintaining this result is wanting—the effort or desire for fusion. We may equalize muscular contraction, but unless images are formed with equal, or nearly equal, clearness on the fovea centralis of each retina, so that the brain can recognize them as images of one and the same object, there is no incentive to co-ordinate the visual axes and hold them in equilibrium, but rather the desire to turn that fovea on which the diffused, unclear image is projected, away from fixation in order that there be no disturbing or misleading confusion of images, with resulting imperfect conception of the object.

Having determined, by the absence of amblyopia and by the

positions of the true and false images, that we have to deal with an uncomplicated case of squint.

1. A careful and full correction of an existing optical defect must be worn sufficiently long to estimate its effect in lessening the degree of squint. The behavior of the eyes under mydriasis will foreshadow this effect. If the squint disappears under atropine it will not return, or only temporarily, under full correction. If the images are not fused.

2. Tenotomy must be done. Each internal rectus should be partially or wholly divided by severing the tendons only, until the false has been superimposed on the true image, each step in the operation being carefully watched. Division of the upper and lower radiating attachments will cause a permanent diminution in the range of convergence and a retrocession of the inner canthus; and

3. If convergence still persists, advancement of one or both external tendons is to be preferred to a second tenotomy.

The treatment of complicated internal squint includes:

1. Improvement of vision.

(a) A careful and full correction of all optical defects.

(b) Amblyopia. It is reported that in very early childhood amblyopia can be cured by training the amblyopic eye, by excluding the fixing eye from participation in the act of vision for days and weeks at a time by means of bandages or atropine. This method is conservative and doubtless efficacious in a few cases and invalidates the excuse for early operation frequently given, that the vision of the squinting eye will still further deteriorate.

(c) The proper age for operation. As is well-known, a want of co-ordination of the eye muscles in infants is common. A child may be several years old before it learns to bring both eyes into harness. This is a second and forcible objection to early interference. The rule, usually followed, is to wait until the child is old enough to wear glasses. I contend that this is too early. The patient should be sufficiently intelligent to discern double images with the tests employed and *to give accurate information of their relative positions.*

(d) Hyperesophoria. Probably 75% of all cases of internal squint are complicated by an upward deviation of one cornea. It, therefore, is essential to successful treatment, that vertical as well as horizontal equilibrium must be secured. Indeed, it is not improbable, that in a few cases of oblique turning of the cornea, esotropia depends upon hypertropia. This statement is corrob-

rated, clinically, by a case reported by me in the N. Y. Med. Rec., Aug. 26, 1893. Girl, aged 5. Hypermetropia 2.50 D, wide internal squint, fixes with R. Interni divided, under ether, August, 1891. Apparent equilibrium, one week later. In June, 1893, again internal squint and the same treatment. Two weeks later the squint is apparently as bad as before the first operation. I am now able to diagnose L. hypertropia 3. L. super-rectus divided: *the convergence becomes immediately divergence.*

I am convinced that my experience is not unique, and that convergent squint treated according to the usual and routine method, is more often a failure than a success. The results amply prove that our conception of the physiology of hypermetropic squint is too limited, and that it should be extended to include the action of the elevators and depressors in conjunction with the interni.

2. Equilibrium through operation. The surgical treatment must be carried out under cocaine anesthesia, since abolition of consciousness is incompatible with scientific accuracy.

(a) Restoration of vertical equilibrium by tenotomy of the superior rectus of the upward, and if necessary, the inferior of the downward deviating eye.

(b) Restoration of horizontal equilibrium by tenotomy of both internal muscles, and if necessary, advancement of one or both externi.

A CASE OF ACUTE SUPPURATIVE OTITIS MEDIA CHARACTERIZED BY HIGH TEMPERATURE AND SYMPTOMS OF BRAIN COMPLICATION. OPERATION. RECOVERY.

BY GORHAM BACON, M. D.
OF NEW YORK.

LOUISE N., aged 6, a patient of Dr. G. M. White, with whom I saw the case in consultation, on March 10, 1893. The history was that two years previously she had a discharge from both ears which soon yielded to treatment. About ten days ago the patient had an attack of false croup, from which she seemed to have recovered, except for a slight nasal catarrh which remained.

On March 4, she had an earache in the left ear which lasted only for two hours, for which Dr. White prescribed dry heat and drops of laudanum and glycerin. Only once again did she have any earache after this.

On March 7, she began to have some elevation of temperature. She complained of no pain about the ear, and it was only after a careful examination of the patient, that a painful spot was discovered by pressure over the left mastoid. There was a slight redness and swelling in this region. This condition of affairs was noticed on March 10. There was no swelling nor pain about the right mastoid.

Two days before this, on March 8, the temperature was $101\frac{2}{5}^{\circ}$ F. at 8:30 a. m., and 105° F. in the evening. On the following day the same fluctuation in the temperature was noticed, and for this rise in temperature small doses of phenacetine were prescribed. She had also had large doses of quinine for the past three days, as the temperature was suggestive of malarial fever, but this was given without any effect on the temperature.

I saw the patient in consultation on March 10, at 10 p. m. The temperature during the day had not been lower at any time than $101\frac{1}{5}^{\circ}$ F., the highest point reached being $105\frac{3}{5}^{\circ}$ F. at noon, and at this time, for an hour, she complained of some earache. The evening temperature was $104\frac{3}{5}^{\circ}$ F. Phenacetine was given in small doses whenever the temperature was high.

I advised using cold by means of the Leiter coil applied over the mastoid, and douching the ear every two hours with a weak solution of boric acid as hot as could comfortably be used. The membrana tympani was congested, especially so about Shrapnell's membrane.

March 11. When seen today at 2 p. m., the temperature was almost as high as on the previous day, having been $104\frac{4}{5}^{\circ}$ F. at noon, and there was the same tenderness on pressure and swelling of the mastoid. I advised operation. Ether was administered by Dr. White, and assisted by Dr. J. Hewitt, I made an incision over the mastoid down to the bone and close to the attachment of the pinna. There was a little softened bone which I scraped away, in the opening in the bone which I made with chisels, at a point a

little above the level of the external meatus and in the direction of the mastoid antrum. As I did not find any pus in this region, I did not think it necessary to force a passage through apparently healthy bone into the antrum and middle ear. As there existed a distinct swelling of the canal in the posterior and upper wall, and in Shrapnell's membrane, I made a free incision in these parts, but blood only escaped. The sinus in the mastoid was washed with a carbolic acid solution and a tent of iodoform gauze inserted and the ear bandaged.

March 12, 8 a. m., temperature 103° F.; 10 a. m., 101° ; 12 m., $104\frac{1}{2}^{\circ}$; 2 p. m., $103\frac{1}{2}^{\circ}$; 3:45 p. m., $105\frac{1}{2}^{\circ}$; 5:30 p. m., $104\frac{1}{2}^{\circ}$; 10 p. m., 101° ; midnight, 101° .

The pulse was rapid. The only treatment besides the warm douching of the ear consisted in the administration of small doses of phenacetine which always brought down the temperature at the time.

Dr. John L. Adams examined the fundus of each eye to-day and found a hyperemic condition of both discs, the same on each side. There has been some deafness, but this has been considerably improved by Politzer inflation occasionally.

I saw the patient the following day and went with my assistant, Dr. Hewitt, all prepared to do a further operation and force a passage through the antrum into the middle ear, but deferred the operation as the temperature had been a little lower during the day. 10 a. m., temperature 101° F.; noon, $100\frac{1}{2}^{\circ}$ F.; 4 p. m., 103° ; 5:15 p. m., $104\frac{1}{2}^{\circ}$; 10 p. m., $104\frac{1}{2}^{\circ}$.

I made a further incision in the upper and posterior wall of the canal, but no pus escaped.

March 14, temperature somewhat lower. At 4:40 a. m., temperature $103\frac{1}{2}^{\circ}$ F.; 8:20 a. m., $100\frac{1}{2}^{\circ}$; 12:30 p. m., $101\frac{1}{2}^{\circ}$; 9 p. m., $101\frac{1}{2}^{\circ}$.

A sticky and tenacious discharge appeared today from the left meatus. Wound over mastoid looks well. The ear was douched frequently with a warm boric acid solution. The highest point reached today by the thermometer was $103\frac{1}{2}^{\circ}$ F., lowest, $100\frac{1}{2}^{\circ}$.

March 15. Child very much better and brighter to-day. There was some pus in the canal, the upper portion of which was still somewhat swollen. No perforation could be detected in the drumhead below the membrana flaccida. 7:39 a. m., temperature 99° F.; 1:30 p. m., $100\frac{3}{4}^{\circ}$; 4 p. m., 100° ; 8:15 p. m., $100\frac{3}{4}^{\circ}$.

March 16. 7:30 a. m., temperature $98\frac{1}{2}^{\circ}$ F.; 12 noon, $98\frac{1}{2}^{\circ}$. Mastoid opening filling up with granulations. Ear still being douched.

March 19. The patient has had no fever since. She is doing nicely. There has been a slight discharge from the ear. A saturated solution of boric acid was ordered to be dropped in the ear several times a day. No perforation can be seen in the membrana tympani, but there is a small granulation attached to the anterior and upper wall of the canal close to the membrana tympani, and there is undoubtedly carious bone and a small sinus leading through. This granulation I touched with nitrate of silver on a probe and insufflated some boric acid powder.

March 31. I saw the patient to-day and found that four molar teeth had been discovered coming through the gums, two on each side, one above and one below. Before this there was not a sign of any teeth. The granulations were cauterized with chromic acid and drops of sulphate of zinc gr. ii $\overline{3}$ i were prescribed.

April 3. Since the last visit the temperature has risen at times to 102 $\frac{1}{2}$ ° F. and 103°. There is more or less swelling of the gums.

April 16. It became necessary today to give ether again in order to more thoroughly remove the polypus. This was done with curettes and the bone of the upper and anterior wall was scraped. There is undoubtedly a small sinus here, but it could not be detected with a probe.

May 14. The bare bone was found covered to-day and the canal contains but a few scales. The treatment since the last visit has consisted in cauterizing the base of the polypus with chromic acid, and the instillation of alcohol drops and sulphate of zinc alternated.

June 1. The patient has made an excellent recovery and has gained much in weight and general appearance.

This case seems to me to present several very interesting clinical points. When first seen, it was only by a thorough examination and by pressing over the mastoid by the attending physician that any trouble was located in the ear, as the patient did not complain of any earache at the time. A thorough examination of the child was made and nothing discovered to account for a temperature of 105° F., except the inflammation about the ear.

Although we frequently have more or less fever at the outset of an attack of acute otitis media, it is very seldom, in my experience, that a temperature shows such a curious course. It seemed at the time that there must be a collection of pus somewhere which gave rise to this fluctuation in the temperature. It was suggestive of a septicemic condition, except that there were no rigors, nor chills, nor sweating.

Although the mouth was examined at various times, there was no redness nor swelling of the gums noticed until March 26. It is a well-known fact that an acute otitis media is frequently caused by teething through sympathetic irritation, and there is no doubt but that the cutting of the four molar teeth played a most important part in the unusual course of the temperature.

I think that from the beginning, the disease was probably located in the mastoid antrum, and that subsequently there was a carious condition developed.

Although at the time of the first operation I felt that I had done all that was necessary, as the bone seemed quite healthy, still, in the light of the subsequent history of the case, I regret now that I did not chisel a passage into the antrum and middle ear at the time.

63 west Fifty-fourth street.

THE STATISTICS OF EAR DISEASE.

WITH TABULATION OF 4785 RECENT PATIENTS (5412 DISEASES).

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THE matter of the statistical reports of dispensary and private practice contains many important questions beside the one of nomenclature, which comes over to us from last year. It is surely of great weight that uniformity should so far prevail as to make different reports comparable; yet it takes little inquiry to bring to light that in many an institution there is no consensus of view and statement among the surgeons, and that its report is at variance with itself.

Passing over the generally accepted point that only the new cases shall be given, to the exclusion of all old cases from previous years, in the annual report, the extremely important question meet us, shall we report patients, or diseases, or both? To report only individuals leaves out of count many noteworthy conditions, and gives occasion for false estimates as to their relative frequency; on the other hand, multiple diagnosis may immensely pad out the statistics according to the arbitrary choice of the recorder, with little or no clue to the facts as to individuals. So a double set of figures more than justifies its cumbersomeness. The matter of sex, like that of childhood or maturity, in its bearing upon various diseases, is frequently most worthy of note, as witness many interesting, although inconclusive, studies. In like manner, the question of which side is affected by predilection in certain diseases or of the bilateral occurrence of the lesion, has come into importance of late, and well deserves record and report. The statement of the results of treatment, always a delicate matter, seems more so here than in most lines of medicine; for the surgeon who looks with complacency at semi-anchylosed joints in his own practice, or the physician who would question your sanity if you found fault with the cure of a pleurisy which left adhesions, expects absolutely perfect results of the aurist.

The nomenclature to be employed and the minuteness of the subdivisions of the cases falling under the wider diagnostic heads, need also some unanimity of choice. The Latin names have almost universal use, even among those who rather strive to use the vernacular; so we need only be more precise and consistent in our usage to give a full and ready answer to the first of these questions; the latter will largely solve itself in practice, since every one will feel the limitations as to the complexity of any table which he wishes to have published. Only by detailed case-histories can all the shades of differing, yet similar, cases be set forth: but anything of this sort will find its level in the remark column, in foot-notes or in fuller narration.

The value of careful statistical reports of private and dispensary work in its influence upon the worker himself must be apparent to anyone who considers it. Nothing short of full individual records can be adequate and satisfactory: but too many find the data sadly lacking in their neglected records when anything moves them to a search—omissions which are annoying and hampering when the return of the patient raises questions as to the previous condition and treatment. But far more mortifying are such blanks when one undertakes to set forth his results and finds the numerous and serious gaps. Yet this very mortification, or the fear of it, is one of the best spurs to greater diligence in studying out and recording cases, which might otherwise be irretrievably, though not very decently, buried in our case-books. Hence, patients will probably profit by being treated with better insight at first and with fuller understanding and recollection later, if the worker is conscious that he has a formal account to give of the details of his stewardship; and the surgeon, possessed of objective data as to measures and results in all his cases, will gain more than vague and scattered impressions of what he has found most efficient in his practice. Thus his work should be constantly and positively instructive, and his records will probably indicate increasing success, especially in those directions in which improvement is most important, yet most difficult. The same gain will naturally redound to the advantage of the student, who now looks longingly but vainly at the reports of many large clinics, wishing that he could accept with less skepticism the showings which they present.

The discussion of the statistics of ear disease at the Berlin Congress will probably lead to some action in the coming Congress at Rome; since it made very evident the discrepancies now existing and gave indications of the steps towards their elimination. In his

recent article in Schwartz's handbook. Bürkner has set forth his deliberate judgment as to the details. He holds that diseased conditions should be the basis of report, that age and sex should be noted, and that results should be recorded as "healed" only when the restoration is practically perfect, anatomically and functionally. No rigid line can be rationally drawn to cover fully all cases; but common sense will clearly indicate in the majority of instances what success can be fairly claimed. Bürkner has utilized such data from his own wide practice and to a less degree from the reports of others; yet the statements thus far made generally leave indefinite many points which might quite readily be explicitly stated. Tabulations are cumbersome and awkward things for publisher and reader; but they can be made very full and valuable with no great increase in their complexity. Several tables may be more convenient for the recording of various phases of the same series of cases; yet a single table can generally be made to show all of this and such of the inter-relations otherwise left unstated.

As an illustration of this, see tabulation on next page of my last four years of practice, giving the figures as to age, sex and ear affected for each of the conditions diagnosticated, as well as the number of individuals, adult and juvenile, grouped according to the diagnosis. The therapeutic results have not been given, because my records are often too imperfect to show them with adequate certainty. In future years it will be easier to use this table almost as a starting point, subdividing its columns so as to show the results of treatment; and by a monthly record therein of every new case and a revision of the records of the preceding month or two, to make this table and the original records upon which it is based, full, reliable and up to date, in a way that is now almost impracticable. Even such a study as the compilation of this table has enforced, has brought into view many a record to which needed additions could still be made from memory or by reason of a recent visit of the patient; and I look for much profit from the review. Thus only can my dispensary services be made as instructive as they should be to myself and others; and I can warmly recommend the method to the notice of my colleagues as abundantly repaying the trouble entailed in such a revision.

TABULAR STATEMENT OF 4785 PATIENTS (5412 DISEASED CONDITIONS) IN 1889-1892.

PERSONÆ		NOMINA MORBORUM	MASCULINI						FEMININÆ						Totals
Adult	Infant.		ADULTI			INFANTES			ADULTÆ			INFANTES			
			A.D.	A.S.	A.U.	A.D.	A.S.	A.U.	A.D.	A.S.	A.U.	A.D.	A.S.	A.U.	
1	2	Auriculæ helicis, Abscessus.	1	1	1	1	1	1	1	1	1	1	1	1	3
1	1	“ Ambustio.	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	“ Congelatio.	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	“ Cystoma.	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	“ Deformitas.	1	1	1	1	1	1	1	1	1	1	1	1	1
8	25	“ Eczema.	1	1	1	1	1	17	2	5	1	1	1	15	46
3	3	“ Epithelioma.	2	1	1	1	1	1	1	1	1	1	1	1	3
2	2	“ Erysipelas.	1	1	1	1	1	1	1	1	1	1	1	1	2
1	1	“ Hematoma.	1	1	1	1	1	1	1	1	1	1	1	1	1
1	2	“ Herpes.	1	1	1	1	1	1	1	1	1	1	1	1	3
1	3	“ Microtia.	1	1	1	1	1	1	1	1	1	1	1	1	3
1	1	“ Perichondritis.	1	1	1	1	1	1	1	1	1	1	1	1	3
1	4	“ Reduplicatio.	1	1	1	2	1	1	1	1	1	1	1	1	4
1	1	“ Ulceratio.	1	1	1	1	1	1	1	1	1	1	1	1	1
3	9	“ lobulæ, Abscessus.	3	1	1	1	1	1	1	1	1	1	1	1	12
1	1	“ Fibroma.	1	1	1	1	1	1	1	1	1	1	1	1	2
1	1	“ Laceratio.	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	Abscessus parauricularis.	1	2	1	1	1	1	1	1	1	1	1	1	5
1	1	“ Adenitis.	1	1	1	1	1	3	1	1	1	1	1	1	7
371	140	Meatus, Accumulatio ceruminis.	57	58	154	16	15	39	27	23	71	14	15	45	537
1	1	“ Atresia.	1	1	1	1	1	1	1	1	1	1	1	1	7
1	1	“ Caries.	1	1	1	1	1	1	1	1	1	1	1	1	2
6	32	“ Corpus alienum.	3	1	1	4	3	6	3	3	1	8	11	4	2
80	11	“ Eczema (O. ext. dif.)	4	13	26	2	9	13	12	8	28	8	1	15	139
1	1	“ Exostosis.	1	1	1	1	1	1	1	1	1	1	1	1	5
35	57	“ Furunculosis (O. ext. circ.)	11	10	7	9	9	6	12	15	11	8	9	5	112
4	4	“ Granulatio.	1	1	1	2	1	1	1	1	1	1	2	1	5
1	1	“ Hyperostosis.	1	1	1	1	1	1	1	1	1	1	1	1	5
1	1	“ Neoplasma.	1	1	1	1	1	1	1	1	1	1	1	1	1
5	2	“ Otomycosis.	2	1	3	1	1	2	1	1	1	1	1	1	10
1	1	“ Trauma.	1	1	1	1	1	1	1	1	1	1	1	1	2
522	271	Totales Auris externæ	86	96	196	38	45	87	57	58	120	48	41	97	969

THE TREATMENT OF TINNITUS IN AURAL SCLEROSIS.

BY RALPH W. SEISS, M. D.

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MUCH has been written within the last few years upon the *operative* treatment of tinnitus aurium occurring as a symptom of chronic aural catarrh, but the literature of less radical measures is but meager.

Yet, in the experience of the writer, there are many methods yielding all the good results which are gained by extensive operations, and which have the immense advantage of being painless and safe.

It is the purpose of the present paper to briefly consider some of the most generally useful of such measures, and to protest against the performance of painful and dangerous operations on cases in which milder measures will secure equally good results.

The therapeutics of "chronic catarrhal tinnitus" of course, includes all measures which may be used to advantage in controlling that never altogether curable disease. Among these, proper treatment of the naso-larynx ranks first, methods directed to the Eustachian tubes next, and immediate local treatment of the tympanum last, in order of efficiency.

Naso-laryngeal therapeutics and the ordinary methods of Politzer's and catheter inflation of the Eustachian tubes are familiar subjects, and do not call for discussion here. The special forms of tubal medication which the writer has found especially useful in tinnitus of catarrhal origin, are oil injections and the direct application of the vapor of menthol to the tubal lining. The oil best suited for the purpose is pure fluid *albolene*, or its chemical equivalent, to which may be added camphor or menthol in the strength of one-half to two grains per ounce. A full-sized Eustachian catheter, a one dram syringe fitting the former on the ground joint principle, and an ordinary catheter inflation bag adapted to the same, are the instruments required. The catheter is introduced in the ordinary way, and firmly fixed in the Eustachian orifice; the syringe is then filled with oil slightly warmed,

fitted to the catheter, and its contents forced into the tube; the syringe is then promptly withdrawn and air inflated through the catheter to gently force the oil further up the tube. The relief of tinnitus, gained by this procedure, is often very great, lasting in some cases for days after a single application. It may be repeated every third or fourth day for a considerable time, and has frequently been known to remove the tinnitus completely for a period of several months, the symptom gradually returning and calling for a repetition of this or some other method of relief. If the oil is warm and sterile, the instruments absolutely clean, and the operator's hands skillful and light, the procedure seems absolutely harmless if repeated not oftener than once in four or five days, and the results obtained are as permanent as those from many far graver methods. The action of the remedy seems to depend on the well-known vascular sedative effect of the medicament used, as well as upon the general mechanical "massaging" and lubricating action of the oil.

Menthol vaporization has been used by the writer for the last year and a half, with excellent results in stopping tinnitus and other aural symptoms dependent on tubal congestion and inflammation. The apparatus generally used is the Dench vapor generator; or for clinic use, a simpler one consisting of a two ounce wide mouth bottle, fitted with a tight rubber cork through which are passed two short L-shaped glass tubes, is employed. Either form of instrument is fitted with two sections of rubber tubing, to one of which is attached an atomizer bulb, and to the other a cone-shaped tip for insertion into an Eustachian catheter. For use, the bottle is half filled with fresh menthol crystals, the catheter is then passed and fixed in the Eustachian tube, the cone tip adjusted, and the bulb compressed, when the vapor, of course, passes through the catheter into the tube, and the characteristic "menthol sensation" is at once experienced by the patient. The compressions may be made continuously for about one minute, or less, if the application should become at all painful.

It is a common experience to at once relieve or stop tinnitus in cases in which simple air inflation has failed to give good results by this treatment; used two or three times per week, in addition, of course, to proper treatment of the naso-pharynx, it has permanently improved the condition of many severe cases, and appears to be a distinct improvement upon older methods.

Among the means resorted to, to directly effect the vascular supply of the tympanum, none has yielded such good results in the

writer's hands as freezing the mastoid region over the branches of the posterior-auricular and stylo-mastoid arteries. Ether and rhigolene sprays were at first used for this purpose, but the former was very slow and cumbersome, the latter highly explosive and difficult to keep, and the writer now uses exclusively the tubes of chloride of ethyl which are furnished for dental operations. The tube being open and held horizontally in the hand, a very fine jet of fluid at once issues from its tip, which is to be directed on the mastoid region until the skin is frozen white over the whole area. Deep freezing is neither necessary nor desirable, an effect so superficial as to be perfectly safe being quite sufficient. Of course, reasonable precautions against the patients taking cold or the production of frost bite are requisite. The freezing may be repeated in a few days if required, but frequently a single use of the method will arrest tinnitus completely for a longer period. Its cautious, repeated use, seldom fails to at least ameliorate the most distressing aural noises, and a certain proportion of cases experience such a high degree of relief that a symptomatic cure may be claimed. It should be clearly understood that the method is advocated only in the tinnitus of sclerotic otitis, and where the usual methods have failed to benefit; the existence of active inflammation is always an absolute contra-indication. The beneficial result of this method of treatment doubtless depends entirely on the nervous influence; the vaso-motor effect of freezing procedures, and that surface-freezing lessens the conductivity of nerves and profoundly affects nerve centers, being well known.

The operations for the relief of tinnitus which have been of late years suggested are very numerous, and the results claimed for nearly all of them have been most brilliant. Especially has excision of the auditory ossicles been lauded as a cureall for the graver forms of ear noises occurring in sclerosis. Early in the history of the operation the malleus was usually alone removed, later the incus was excised; at present, the usual procedure is to remove the stapes, or at least its crus, allowing the larger bones to remain in situ. A careful study of recent literature on the subject can hardly fail to leave an unprejudiced reader with the idea that many of the operations reported were hopelessly haphazard, and that all that seems absolutely necessary is to remove some part of the ossicular chain to secure the most brilliant (!) results.

The fact is, that almost any operation whatever performed upon an ear which is the seat of catarrhal tinnitus, will stop or relieve the noises for a longer or shorter time, but it is equally certain that

the sounds are almost sure to return, often in a more aggravated and necessarily hopeless form.

While the relief to tension gained by a scientific ossicular excision may permanently relieve tinnitus in a very few cases, as a definite curative procedure it must be regarded with grave doubts in sclerotic cases, and in the writer's opinion, should never be performed except as a very last resort, and then must be regarded largely as an experiment.

Almost the only operation now performed by the writer for the relief of this symptom in catarrhal cases is mobilization of the ossicles; the principle of the Siegle masseur being supplemented by mechanical force, and the ossicles liberated to a greater or less extent. The method has the advantage of nearly perfect safety, comparative painlessness, and can be performed several times upon the same ear without injury. It rarely fails to relieve subjective noises for at least as long a time as the most radical excisions, and as it practically leaves the ear in the same condition as before the operation, it can be repeated in a year, or less, if necessary. Several very chronic cases have been greatly relieved for more than a year after its performance, supplemented by the usual naso-pharyngeal and tubal treatment.

The therapeutics of tinnitus aurium by drugs internally administered, offers but little encouragement in fibro-blastic catarrh; bromides and their derivatives, iodides, pilocarpine, etc., etc., do certainly relieve a few patients, but their continued use is very undesirable, and the good effects are soon lost. Their use has been almost altogether abandoned by the writer, or relegated to a few cases in which some other condition seemed to have as much to do with the noises as the aural lesions.

Chronic sclerotic otitis is essentially as incurable a disease today as it was twenty years ago: the slow, insidious fibroid changes tend to progress, no matter what be done, and the inevitable effect of irritating methods of treatment, no matter what their first results may be, must be to increase the fibro-blastic changes and hurry the patient on to hopeless deafness and incurable tinnitus. But by the employment of proper means, a few of which have been suggested, the process may be arrested in some cases for many years; and in nearly all, much may be done to lessen the patient's discomfort, of no form of which do cases of sclerotic otitis so bitterly complain as of tinnitus aurium.

A CASE OF MYXO-SARCOMA.

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DURING the early part of October, 1892, there came under my observation a child, aged 5, presenting quite an interesting clinical history. This child had previously been under the care of Dr. Bayne, who referred him to me. The patient was born to parents of unusually good health, and free from any hereditary physical defects or vice. The child was strong and apparently in perfect health until the end of his second year. At this time, his parents noticed that he "sniffled," and that his nasal breathing was somewhat impaired. This difficult nasal breathing became slowly but progressively worse, and was followed by a train of symptoms due to imperfect nasal respiration. He became restless at night: snored and caught his breath: would wake up crying as though frightened; breathe with his mouth open; and on awakening in the morning, would be cross and irritable. About six months before coming under my care, the parents noticed that his voice was muffled and had lost nearly all its nasal quality. The child now began to lose flesh, showing but a slight desire for food. About this time, a growth developed upon right side of neck, and it was also observed that something was protruding from the left nasal cavity. Discharge from nasal cavity was thin and watery, never sanious, nor was there ever any free bleeding. Shortly before consulting Dr. Bayne, dysphagia was added to the child's already pitiable condition. At this time, the inability to ingest food was confined to solids, liquids being taken with some degree of ease. Dr. Bayne removed the mass protruding from the nose and then referred the parents to me.

On presentation, he was noted to be a well formed boy of average height; body and face extremely emaciated; nasal breathing entirely annulled, oral breathing distressingly loud and unpleasant. He was very weak; voice almost absent and unintelligible; was drowsy, and if held quiet for a few moments, passed into a deep sleep. Externally his nose was well formed and showed no deformity. On the right side of neck there was a tumor of about three centimeters in diameter. The mother stated that for about three days the child had found it almost impossible to ingest food, either liquid or solid, and she feared that he would starve if something were not done immediately. I found her statement to be absolutely correct as the child could not swallow water when offered. Both nasal cavities were filled with a grayish white mass which protruded slightly. The mouth was in a horribly offensive condition; the lips were fissured and covered with dry crusts and the teeth with sordes. The tongue was dry, horny, and

deeply congested along its free borders. The hard palate was covered with a dark brown deposit, and the soft palate pushed forward until the uvula rested on the center of the dorsum of the tongue. The whole pharynx was filled up with a dirty grayish white mass that extended well into the mouth. This mass was more or less lobulated, and its lower borders were hornified. I appointed the next day for operation.

Suspecting the growth was malignant, I prepared for considerable hemorrhage. I operated without the use of an anesthetic; Dr. Balloch assisted me. I removed the mass from the nose, first with the cold snare, attended with only moderate bleeding. The pharynx was cleared with the finger and post-nasal forceps. The hemorrhage from the whole operation was much less than ordinarily attends the removal of post-adenoid hypertrophies.

The child was greatly improved by the operation, and gained strength and flesh very rapidly. On the fourth day after the operation, I observed a large mass of mottled grayish black tissue in the left nasal cavity, which I removed with the snare. This mass was slightly necrotic and I thought it was a piece that I detached and failed to remove during my first operation. Four days later, on the child reporting, I found the cavity again filled out with a mass similar to the one removed at the previous sitting. This mass was about three centimeters long by about one centimeter in diameter; softer and more pultaceous than the first tissue removed. Bleeding was also more active. I was now firmly convinced that the growth was a myxo-sarcoma. In four days, there was a greater reproduction, extending even into the pharynx. On this day, Dr. Balloch confirmed my diagnosis by telling me that the tissue originally removed was from a myxo-sarcoma. I now consulted with Dr. Bayne as to the advisability of doing a more formidable operation. The excision of the superior maxilla met with his approval and the day appointed for its removal. The child's condition on the day of the operation, although only six days since my last interference, was quite as bad as previous to any operative interference whatever. The attachment of this growth seemed to be about midway of the under surface of the middle turbinated bone. With the assistance of Drs. Bayne, Van-Rennselear and Luce, I did Billroth's operation for resection of the superior maxilla. Chloroform was administered. An incision was made from the root of the nose, extending in the median line to its tip, through the soft tissues and into the nasal cavity, upon the side to be operated upon. From the root of the nose, an incision was carried outward to the malar prominence. In making this latter incision, care was taken in carrying the knife along the margin of the orbit, to avoid the infra-orbital foramen from fear of dividing the artery issuing from this canal and thereby cause troublesome hemorrhage. An incision parallel to the second incision was carried from the ala of the left nasal cavity to the border of the masseter muscle. The nasal bones were now disarticulated and the flap containing the left nasal bone was rapidly separated from the left maxilla and thrown outward. Bleeding vessels were taken up as divided, and consequently only a very slight amount of blood was lost. The whole nasal cavity was now exposed, and filling out this space was seen the same character of growth that had been so often removed. The growth was traced under the middle turbinated bone, from whence it seemed to have its origin by a broad base. The body of the superior maxilla was now separated by sawing outward, in

the lines of the skin incisions, and after the mass had been separated, it was pried out of its position and turned outward upon the cheek. As the growth now could be seen to involve the antrum, probably secondarily rather than primarily, I decided to remove the bony mass entirely, and therefore separated it from the pterygoid process. A part of the palate bone and the pterygoid process were torn away by forceps. The whole cavity was now free of growth. Rough edges were curetted away and the cavity having been packed with iodoform gauze, the skin flap was brought into position and carefully united. Hemorrhage was quite free, but to no alarming degree. The patient bore the operation well and rapidly recovered from the shock. There was no bleeding after reaction set in. The patient was in good spirits and quite hungry the next morning; had no fever. On the fourth day, the iodoform dressing was removed, coming away quite clean, and new gauze introduced. On the fifth day, all stitches were removed and union found to be perfect. On the seventh day, the gauze was finally removed. There was no fever throughout. There was only a slight difference to be noticed in the prominence of the two sides of the face. At the end of the third week, as the child seemed to be in a perfect condition, I discontinued my visits. Five weeks later, the mother requested me to see the child on account of the rapid increase in size of the tumor on the right side of the neck, and if possible, to relieve the child from the great pain that this rapid increase in size had occasioned. The growth had now assumed enormous proportions and filled out the whole right cervical region, extending from the mastoid to the clavicle. I also noticed a smaller growth, on the left side, just above the clavicle. During the following week, new growths appeared in lateral walls of the pharynx and in left cervical region; there was no recurrence in nasal cavity.

Four months after the operation, the child died from inanition and exhaustion.

In looking over the histories of some sixty cases of nasal and naso-pharyngeal sarcomata, many of the latter, no doubt, having their origin in the nasal cavity. I find several that correspond in their description very much to the case above given. In these extensive growths I find that the patients were quite young, but none so young as the case here presented. Rapid reproduction is common in sarcomatous tissue, but the rapidity of regrowth in this case was of a startling nature. To have all evidences of a growth removed in one day and within six days thereafter to have it nearly reproduced in its original magnitude is sufficient to excite the admiration of any pathologist. We have all been taught that hemorrhage is quite a necessary attendant upon malignancy, especially is this stated in regard to sarcoma. It therefore appeared to me to be quite remarkable that this little one had had no trouble of this character, and that the various operative procedures were attended with so little bleeding. The micro-pathological find was that of a most typical and exquisite myxo-sarcoma. Disseminated

throughout this mass of tissue were single fibers of striated muscular tissue. The section which showed these muscular fibers in the most pronounced manner was obtained from a mass removed from the nasal cavity.

There are several points in connection with the operative interference that require consideration. In a case of this character where operative interference was not so immediately demanded to relieve the urgent symptoms, I think it would be wise to first ascertain the character of the growth before resorting to any instrumental interference. It seems that all interference, excepting that it be of radical character, intensifies the rapidity of growth and its malignancy. One well knowing the nature of the growth, they can consider, from its seat and attachment, whether it is possible to remove in its entirety and more thoroughly by the snare, or whether it will be necessary to resort to one of the more formidable operations. Growths so extensive as the one outlined above should, if any operation is attempted, be dealt with in a most liberal manner. The reason the above case was not so treated at first was on account of the desperate condition of the child and the necessity for immediate action. A positive diagnosis could not be made out from its clinical history alone. It is also a question whether even the latter operation would have benefitted this patient, as no doubt a general sarcomatous infiltration had already set in when he was first brought under my observation.

1102 L street.

A CASE OF TRAUMATIC EPILEPSY RELIEVED BY OPERATION ON THE NOSE.

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ANYTHING bearing on the question of the etiology of epilepsy, or adding to the testimony that it is, in many instances at least, a disease of local origin, due to some form of irritation, cannot help but be interesting. The following case which came under my care at the Manhattan Eye and Ear Hospital is accordingly reported:

Charles S., aged 16, presented himself at the hospital May 29, 1893. He was a poorly nourished child, showing plain evidences of close confinement. Family history absolutely negative, no trace of epilepsy to be detected. Questioning the mother closely, elicited the following history:

As a child he was never very healthy, though never seriously sick. In July, 1892, while playing ball, was struck by a baseball bat in the face, causing a fracture of the nose, as the family physician informed her. Previous to this accident child had frequently injured his nose by falling. On February 17, 1893, while at work, child was seized by an epileptic attack lasting some fifteen minutes. A second attack followed two days later, seen by the mother, in which there was a general convulsive movement of the hands and feet, biting the lips, and entire unconsciousness. The next day there were three attacks, and again during the last of March. During April and May, attacks came at irregular intervals in spite of medicine given by the local physician.

On his first appearance at the hospital, child presented all the appearance of a mouth-breather; examination of nose revealed a septum so far deviated to right, that all breathing in the right nostril was cut off. The cartilagenous septum was particularly dislocated, but in addition, the vomer had been fractured, and with the perpendicular plate of the ethmoid was much distorted and greatly thickened on the right side.

It was decided, as a preliminary step to the correction of the deviation, that the prominent bony spur jutting out into the right inferior meatus be removed. This was done by my colleague, Dr. Dwight L. Hubbard, under cocaine, by means of a Curtis saw. The mother states that there was one attack shortly following the operation. On June 19, the boy was placed

under ether, and the septum thoroughly broken up by means of Adam's forceps, and a Behren's perforated cork splint introduced. The child experienced immediate relief in his breathing. I was unable to see him but once or twice after the operation, and on my return from a short vacation, found that the septum had gone back to almost its original deformity. This necessitated putting the child a second time under ether on September 27, and again breaking up the bony septum. This time the wound healed nicely.

At the date of this writing, November 11, there has been no return of any epileptic seizure; there is good breathing in the right nostril. and parents and child are equally delighted with the result.

In connection with this case it will be of interest to compare a somewhat similar case reported by Dr. S. Weir Mitchell, (*Am. Jour. Med. Sciences*, 1889).

A very careful examination of the current literature reveals an astonishing number of cases of epilepsy of reflex origin relieved by operation in other portions of the body. Among them, several where the removal of impacted cerumen in the outer ear has entirely done away with all symptoms. We were unable, however, to find but this solitary case of Dr. Mitchell's, and the report by Dr. DeVilbis, Ind.. (*St. Louis Med. and Surg. Jour.*, 1884) of three cases of nasal catarrh with conjoined epilepsy in which the epilepsy was cured in one case, and much relieved in the two remaining by proper attention to the nasal trouble. As Dr. DeVilbis very truly remarks, "an irritation of almost any part of the body except the nasal cavities has been said by authorities to produce it. (epilepsy), and, if so, why not an irritation of cavities so closely connected to the great center of the nervous system."

The case of Dr. Mitchell was "a girl aged 17, who was afflicted with epilepsy. The girl was of a weak mind and attributed the attacks to a fall on the head. An examination revealed that she had a purulent discharge from the left nostril. In the effort to treat this it was discovered that that side of the nose was completely occluded by a foreign body. This was extracted piece by piece, and was found to be a bean, which, in foolish play, had been pushed up the nose and lodged there. It had, at one time, begun to sprout, but the growth had manifestly been arrested by circumstances unfavorable to its increase. The removal of the bean, and the washing out of the nostril with proper astringent solutions, resulted in a complete cure of the fits. The attacks were most positively of epileptic nature, and had nothing about them of a hysterical quality."

Both this case and the one the subject of this paper, show plainly irritation as the cause of the attacks. In the case of Chas. S., the absolutely negative family history; his entire freedom from anything approaching an attack, up to the time of the receiving the injury to his nose, the marked deformity caused by the fracture, with the almost immediate relief on the correction of the obstruc-

tion, seems to furnish conclusive proof as to trauma being the cause of this case. It might be said further, that there was not the slightest sign of any hysterical condition from first to last. How the accident acted to induce the attacks, whether directly (it seemed certain that the ethmoid had received a severe injury), or indirectly, by reflex action as in Dr. Mitchell's case, we cannot say, nor would we speak too emphatically regarding any return of the attack at a subsequent period. At present, however, it looks as if he were permanently relieved.

117 East Fortieth street.

TONSILLITHS.

BY WALTER B. JOHNSON, M. D.,
OF PATERSON, N. J.

THE case here reported of calcareous deposits in the tonsils is both interesting and instructive. The condition has been described as "stone in the throat," "gravel of the tonsils," etc., but is now universally termed "tonsilliths."

J. M. B., aged 65. A strong, healthy man, full-blooded, and of rather active habit, weight 160 pounds, has had some muscular rheumatism and three attacks of gout, the last about one year ago; he never had any chalky concretions or enlargements about the joints.

He first had throat trouble when a boy, he remembers expectorating small formations, which he describes as small, odorous particles; in 1850 he had a severe attack of inflammatory tonsillitis, and since then has suffered more or less from throat trouble each winter.

During the past winter he has had decidedly more trouble with his throat than usual, and he has continuously used an atomizer without receiving any appreciable benefit. On August 20, 1893, while coughing, he found a small particle of a hard material in his mouth, it was about the size of a pea; the cough was immediately followed by the expectoration of an ounce or two of blood, and there was more or less blood in all the sputa for the next three days.

August 23, he discharged another similar concretion which was the size of a very large pea, and, immediately following this, coughed and spit up several ounces of blood; during the next five days the sputa was always streaked with blood, and on two occasions, in the morning, slight hemorrhages occurred.

August 28, the concretion, when examined, was found to be very hard and dense, grayish white in color, rough on the exterior, and irregular in shape.

Examination of the throat disclosed a chronic inflammation of each tonsil and considerable hypertrophic changes, many of the tonsillar crypts were dilated and contained masses of cheesy deposit, and there were some small concretions, similar to those already described, on each of the tonsils; there was no acute inflammation and no severe softness about the fauces.

The spontaneous expulsion of the concretions undoubtedly resulted from coughing while clearing his throat in the morning, the catarrhal condition which was constantly present causing him to habitually clear the throat.

The hemorrhages, which occurred with the expulsion of each tonsillith were, it is believed, unusually severe, and undoubtedly due to the removal of the roughened concretions from the hypertrophied, hyperemic tissue.

August 30, several small concretions about the size of a mustard seed and very hard, and also a number of cheesy masses were removed from the dilated tonsillar crypts with the forceps; the procedure was followed by a slight hemorrhage, and the sputa was tinged with blood for the next two days, after which time the tonsils assumed their normal condition, and the patient concluded that he was sufficiently comfortable to abstain from further treatment, and he has lately reported that he was having much less trouble with his throat than usual.

The case is interesting in consequence of the rarity of the condition: while the presence of the cheesy deposits in the dilated crypts favor calcareous formations and act as a nucleus for them, and the hyperemic condition of the tonsil attending the catarrhal inflammation constantly keeps up the increased blood-supply which is conducive to the deposit of carbonate and phosphate of lime salts.

The constant pressure to which the parts are subjected during the acts of deglutition, hawking and coughing, cause so frequent an expulsion of the cheesy deposits that they do not remain sufficiently long in the tonsillar crypts to form a nucleus for these calcareous deposits.

The case was peculiar in consequence of the presence of so severe a hemorrhage on each occasion of the time of the expulsion of the concretion, and in its continuance for so long a period after, also in the absence of severe inflammatory symptoms during the attack, although his throat was in a considerably more uncomfortable condition than was usual, and he suffered from increased cough.

There was no difficulty in deglutition, nor dyspnoea, and the surrounding parts were not specially affected by any extension of the inflammation.

170 Broadway.

THE TOXIC AMBLYOPIAS; THEIR SYMPTOMS, VARIETIES, PATHOLOGY AND TREATMENT.

BY CASEY A. WOOD, C. M., M. D.,
OF CHICAGO.

(Continued from Vol. II, page 237.)

SYMPTOMS, DIAGNOSIS AND PROGNOSIS. TOBACCO. ALCOHOL.
TOBACCO AND ALCOHOL. QUININE. IODOFORM.
CARBON DISULPHIDE.

BRAUCHLI (76) from 39,428 patients of Prof. Haab's klinik in Zurich, gives the following interesting facts: One hundred and forty-four cases (0.365%) were certainly due to tobacco and alcohol, alone and combined. Ninety-five were due to alcohol and tobacco; in only two of sixteen cases attributed to alcohol was the use of tobacco excluded; in no instance were the so-called pure tobacco cases free from suspicion of indulgence in alcohol. As predisposing causes of the amblyopic symptoms, were mentioned typhoid fever, malaria, loss of blood, syphilis, toothache, and irregular habits of life. Most of the patients were between 36 and 55. Visual disturbances were generally the same in both eyes. In eighty cases there were central color scotomata, and in ten complete red blindness. In the majority of instances there was distinct decoloration of the temporal half of the papilla. Only eighteen per cent were cured; thirty-seven per cent improved; and unsatisfactory, the large amount of forty-four per cent.

J. Hutchinson, Jr., (77) in reporting certain exceptions to the usual symptoms in A. T. amblyopia, gives the following example of a rare form of the disease, a unilateral affection of sight:

G. W., aged 42, came in April, 1884, regarding his right eye. V., R. = $\frac{20}{70}$, and J. x. V., L. = $\frac{20}{20}$ and J. i. Smoked one-half ounce "shag" daily, but no suspicion was held at the time that his amaurosis was due to this cause. His vision deteriorated, until in September, 1884, his left eye also failed. January, 1885, V., R. = $\frac{20}{100}$, J. xix at 7". V., L. = $\frac{20}{20}$, J. xvi at 7". Fundi both normal and fields for white good. There were the usual scotomata for red and green, none for blue or yellow. No sugar or albumin in urine. Avoided "shag" but continued to smoke lighter tobacco, and under treatment improved, and finally recovered good vision in both eyes.

This writer also notes the following exceptional points about some cases of A. T. amblyopia he has met with: 1. Not uncommonly a central scotoma for yellow, with or without some limitation of the color field. 2. Very rarely blue shows a central scotoma, *i. e.*, red, green, yellow, and blue are all confused or mistaken in the central part of the field. 3. The amaurosis may for a considerable time be confined to one eye only. 4. With the central scotomata and great defect of distant vision, good near vision may be retained. 5. The color scotoma, may, at any rate for a time, be wholly absent. 6. Even mild kinds of tobacco may produce amblyopia.

Before leaving this subject, I would direct the reader to an article by Coursserant (78) on the employment of injections of pilocarpine in the diagnosis of the amblyopia from tobacco-alcohol. Speaking of the value of the drug in diagnosis, he claims that immediately after the sweating, salivation, and other signs of increased secretion and excretion had set in, a decided increase of the visual acuity, lasting at least twenty-four hours, will be noticed in cases of toxic amblyopia. Furthermore, where optic pallor is present, the sight does not improve after injections if the decoloration be symptomatic of a true atrophy; indeed, Coursserant has witnessed a continuous and oftentimes a rapid deterioration of vision when the pilocarpine treatment is employed in the non-toxic cases. This test, which resembles that with amyl nitrite, does not, like it, depend for its action upon the temporary flushing of the optic capillaries, but upon the powerful, if transitory, elimination of the poisonous alcohol and tobacco from the system.

It is as if the circulation in, and nutrition of, the central centers so improved that the poisonous load could be temporarily lifted, and the visual act, while the bettered condition lasted, be performed with greater ease. Such an improvement could not, of course, be expected when the visual centers or optic elements themselves had been destroyed by disease.

The case for the retro-bulbar neuritis of A. T. amblyopia, as opposed to other forms of optic nerve atrophy, rests upon its distinctive signs and symptoms just related. These form such a constant, such a classic series, that when an unusual condition presents itself it must be regarded *as probably of foreign origin*. To this category, I would consign the inequality of the pupils (2.5%); Argyle-Robertson pupil (1%); dilatation of the pupils (6%); reported by Ulthoff. As for the cases of conjunctival xerosis, uniform pallor of the disc, hyperemia of the papilla, and nystag-

mus. mentioned by Uhthoff and others, they may be classed with the "toxic hysteria" of Gilbert (79) as, at least, of doubtful origin. In this list it would not, perhaps, be fair to include paresis of the ocular muscles. These may set in as the result of an atrophy of their nerve supply. Such cases are merely examples of the peripheral neuritis of advanced alcoholism that may effect the peripheral nerves in *any* part of the body. Among the thousand cases of chronic alcoholism, examined by Uhthoff, muscular anomalies were not uncommon, about 2 per cent, omitting two cases of nystagmus.

Thomsen (80) has described three cases of acute alcoholic paresis affecting the ocular muscles, one of whom recovered.

Suckling (81) reports such a case. of a male patient, aged 50, who had an oculo-motor paresis. He was first attacked with painful cramps in both legs, followed by bilateral paralysis of the rectus inferior and internus, associated with ptosis on both sides. The pupils were contracted and barely reacted to light. No patellar tender reflex, plantar reflex exaggerated. The posterior tibial nerve was tender on pressure. Patient's intellect weakened. Abstinence from alcohol brought about a cure of the ocular paresis.

The *prognosis* is very favorable, especially in those cases where abstinence from the toxic agent is insisted upon and persistently practiced, where the general health is not impaired beyond restoration, where there is no other optic nerve trouble, where the visual field for white is not contracted either peripherally or centrally, where (with all manifest refractive errors corrected) vision does not fall below $\frac{6}{200}$, and where the media are clear, sight can, in the great majority of cases, be restored by judicious treatment in from four to ten weeks.

Cacteris paribus, the length of time occupied in successfully treating a case of tobacco or alcohol amblyopia will depend upon the time his bad vision has lasted, *i. e.*, upon the extent of the ravages which the interstitial neuritis has made among the sensitive macular fibers of the opticus.

But a patient may be practically blind for years, and yet recover.

Over two years ago, a farmer, aged 53, presented himself to me for treatment. He had not been able to read a newspaper for six years. Much of his time had been consumed in going about the country in search of glasses, and although each optician that saw him advised him to consult an oculist, he doggedly refused to do so, having in mind some friend whose eyes had been "ruined by having them tampered with by eye doctors." His was a well marked tobacco amblyopia. He returned home the day I

saw him armed with a large bottle of syrup of hypophosphites, having given me a conditional promise to reform his habits, and to return in the near future. A year afterwards he sent me a note by a neighbor, who also came to consult me, saying that he was all right now, could read as well as he ever did, and thought of beginning to smoke again in moderation.

QUININE.—To the collection made by Atkinson (82) in 1889, most of the published cases of quinine amaurosis, and to the remarks accompanying the report, there is very little to add so far as the diagnosis and prognosis of this form of toxemia is concerned. The first published case of quinine amaurosis, by Giacomini (83) in 1841, as well as of thirteen other cases recorded by Lewis (84), McLean (85), Baldwin (86), Trousseau (87), Guersant (88), and Briquet (89), are anterior to (26) Von Graefe's cases (1857), previously referred to by me as the first on record. I have taken the liberty of quoting extensively from Atkinson's admirable compilation, and am indebted to him for several references.

The original investigations of DeSchweinitz (90), (to be afterwards considered), regarding the pathology of ocular cinchonism were published at a later date, and with Atkinson's review, comprise, practically, all that we know about that affection. From these two sources the English reader may obtain a complete knowledge of the subject as it stands to-day.

The signs and symptoms of quinine amaurosis do not vary greatly. Knapp (91) addressing the Heidelberg Ophthalmological Society, 1881, stated them as follows: "Marked pallor, general weakness, twitching of the mouth and extremities, *total blindness*, and deafness associated with loud *tinnitus aurium*. The pupils are widely dilated and do not react to light, but may to accommodation. The patient often loses consciousness to a greater or less degree, and it may be that the blindness and deafness are not noticed for several days because of the mental condition present. The ophthalmoscope shows *an absolute anemia of the optic nerve and retina*. *The papilla is chalky-white and no trace of a blood vessel in that or the retina is to be seen*. This state of things is to be seen in *every case*."

Atkinson thinks the eye signs of quinine amaurosis constitute a symptom-complex, as follows: "1. Transitory blindness, complete or incomplete, usually developing suddenly. This blindness may be more complete than in any other recoverable condition, and is comparable to the blindness of atrophy. 2. Color blindness. As sight begins to return, most cases will be found to be color blind, completely or partially. The color sense gradually returns and may ultimately become restored. In some cases the

diminution of light sense is permanent. 3. Wide dilation of the pupils. The pupils are irresponsive to light, but are said to respond to accommodation effort. It is to be inferred that the dilation is due to the blindness, and that there is no implication of the third or sympathetic nerves. 4. There is pallor of the optic discs and extreme diminution of the retina vessels, both veins and arteries. In many cases this is permanent. In cases examined early by the ophthalmoscope, a whitish haze, with cherry-colored spots, has been observed at the macula, as in cases of embolism. [Browne (92), Buller (93), Gruening (94)]. 5. There is contraction of the visual field. This is extreme and expands slowly. There is no reliable evidence that it ever regains its normal extent. "The contraction is concentrical or elliptical with the longest axis in the horizontal direction." Knapp (95). *Impairment of hearing (at times to total deafness), with tinnitus, appears to be present almost invariably.* It is rarely complete more than twenty-four hours and gradually disappears. Some variations from this type have been noted. Voorhies' (22) patient had anesthesia of the cornea. Diez (96), Knapp, and Browne observed divergent strabismus. One of Roosa's cases (97) had marked nystagmus; likewise one of Knapp's. Dickinson (98) noted in his patient "marked congestion of the retinal and choroidal vessels, together with a remarkable tumefaction of the optic disc, it appearing swollen and pushed forward prominently into the vitreous. Its condition was very similar to that denominated '*staunungs-papille*,' (choked disc), the usual concomitant or resultant of neuroretinitis." This is a striking variation from the otherwise universal experience, and it may not be impossible that the symptoms in this case were expressions of malarial intoxication, such as are occasionally observed.

"Taken altogether, the symptoms of quinine amaurosis are strikingly definite and constant. Knapp's first case appears to show that relapse may be excited by quite small doses. One of Nettle-ship's patients (99) exhibited the predisposing idiosyncrasy in its extremest degree, his sight being seriously damaged by twenty-three grains of quinine administered during three days, two years after he had been similarly affected by quinine."

Rogers (100) thinks that *incomplete ocular cinchonism* is not rare, and asserts that an hour after twenty grains of quinine have been taken some accommodative paresis may be noticed in a goodly percentage of the cases; that at the end of the second hour it is complete, so that a No. 10 convex glass (+ 4. D?) is required to enable the patient to read at the usual near point.

This paresis lasts eight to ten hours. The greater number of incomplete ocular cinchonism escapes observation or record.

“Briquet (89) who saw four such cases, thus describes the evolution of the symptoms. Says this writer, the patient begins to complain of the light, and the effort to fix the eye upon objects is painful. There is a sensation like that produced by using strong glasses. The eye is brilliant. The pupils are usually normal and the conjunctiva not injected. There is then a slight degree of excitation of the optic nerve, analogous to that so often seen in the beginning of paralysis of the nerve. In a more advanced degree, patients see as through a mist. Objects seem small or double, or are not perceived at a distance of two or three meters. Finally, incomplete amaurosis may occur when the pupils become dilated and insensible to light.”

Briquet quotes Monneret as also having seen four cases of this incomplete amaurosis.

“In most cases the blindness develops suddenly. More than once it has been described as occurring ‘just as if a lamp had been blown out.’ In many cases, however, vision fails much more gradually. Blindness generally becomes complete within twenty-four hours, though in some cases several days may elapse before this occurs. The duration of total blindness, the absence of all perception of light, varies within wide limits from a few hours [Peschl (101), Webster (102), et. al.] to a day or more; [Briquet, Baldwin (86), Buller, Gruening, et. al.] to several weeks, even many; three, Gruening; five, Michel (103); ten, Voorhies; nearly three months, Dewey (104). In most cases, perception of light returns within a few days. There is no case recorded where blindness remained absolute. In all sight was recovered, though often slowly, and nearly always imperfectly. Six months after the beginning of blindness, one of Gruening’s cases was still partially color-blind, and the fields of vision remained contracted. During the greater part of the first year, one of McLean’s patients could look steadily at the sun without seeing it or even without any painful sensation being produced. In one of Roosa’s cases the visual fields remained contracted, the optic discs pale, and the arteries small. In another, the patient whose vision was said to have been perfectly normal previously, felt, after two years, as if there had been a veil over the eyes, and she could not tell if her linen was clean as it came from the wash. She was also unable to distinguish certain shades of dark blue. In Voorhies’ patient the optic discs remained perfectly white after nearly a year, and there was

no trace of the central artery, except a small twig. The visual field was greatly contracted after an interval of twenty-two months. Buller found in his patient a total abolition of all sense of color, except by central perception. Central vision was perfect. The nerves were both pale, but not white. The arteries and veins were not one-third as large as normal. Webster reported a case, where, seven years after the beginning of blindness, which was total only a few hours, the sight remained impaired. Browne states that in one case the visual field remained contracted after fifteen years. In nearly every case where the condition of the sight was accurately determined, some damage to vision remained when the patient was last observed. As regards peripheral vision, the blindness remains permanent. Central vision gradually returns to the normal after some days, weeks, or months. (Gruening).''

As rare exceptions to the very definite symptom-complex of quinine amaurosis, is a case reported by Jodko.¹ in which there were central scotomata, but no fundus changes. H. C. Coe (105) records a case in which internal strabismus, with slight ptosis, was produced by five grains of quinine taken four times a day for five days. Patient recovered.

Some unusual eye symptoms are noticed by Mellinger (106), and by Emile Roger (107), but they may be regarded—like the above—as quite exceptional, if not accidental.

The *prognosis*, so far as sight is spoken of in the sense of central vision, is very favorable. Where an embolic process is the pathological condition present, damage to peripheral vision is, in the nature of things, likely to persist. But there are few ocular conditions, and certainly no other toxic states in which a patient is so certain, after a total blindness, to recover in so short a space of time such good and useful vision as can confidently be looked for in quinine amaurosis.

IODOFORM. In addition to the case of iodoform amblyopia, published by Hirschberg (17), and detailed in a former chapter, E. Hutchinson (108) and Priestly Smith (109), have more recently furnished us with interesting histories of two others. The latter writer confirms the propriety of placing this drug in Class I. Division 1, and gives us the following history:

H. B., aged 31, was admitted to Queen's Hospital with a disease diagnosed as tubercular pleurisy and peritonitis. For forty-one days he was given two grains of iodoform three times a day, the dose being increased

¹ Quoted by Uthoff, *loc. cit.*

during the last ten days of treatment to four grains eight times, or thirty-two grains per diem. After thus taking 1,000 grains, he experienced the general poisonous effects of the drug—faintness, diarrhœa, twitching of hands, constant taste and smell of iodoform, etc. On the third day, after stopping the remedy, there was great drowsiness and ptosis: the latter symptom disappearing the next day. On the fourth day, refraction was found to be normal, and the media clear: haziness of the disc, but no papillitis: vision greatly impaired, and an absolute central scotoma. Red scotoma as in tobacco A., but larger. Loss of vision began two days before stopping the drug and rapidly increased. Three days afterwards the papilla more hazy. Four weeks later patient had still a central color scotoma in both eyes: absolute just below the fixation point. V., R. = $\frac{5}{36}$, V., L. = $\frac{6}{24}$. Vision rapidly improved, and in three months was $\frac{6}{8}$ u. o., and no scotomata. The patient did not smoke during his stay in the hospital, but began in moderation while undergoing outside treatment.

Nothing is said about this man's habits as to indulgence in alcohol.

E. Hutchinson reports his case as follows: E. G., merchant, age not stated, non-smoker and temperate user of wine, consulted Dr. Hutchinson in February, 1885, for visual failure beginning at previous Christmas holidays. He got rapidly worse, and at time of examination V. = $\frac{1}{100}$ in either eye. Color perception and visual field normal. No pain in eyes. Fundus normal, except that discs were gray. He had been taking six grains of cresote and nine grains of iodoform in pill form since January, 1884, more than a year. The iodoform in the pills were stopped, and hypodermic injections of strychnine gr. $\frac{1}{10}$ daily given. Improvement rapidly followed, and on April 26, V., R. = $\frac{20}{30}$ and V., L. = $\frac{20}{40}$, and could read easily with his hyperopic correction.

The *prognosis* is very favorable. Hirschberg's patient was well and the eye entirely normal in eight days. Hutchinson's in two months, and Priestly Smith's in six months after beginning treatment.

CARBON DISULPHIDE. The principal difficulty in setting forth the symptoms of carbon disulphide poisoning, resides in the fact that many of the patients were either smokers or drinkers, or both, and it is a question whether the central scotomata in some of the published instances may not have been due to these agents. When, however, vision was good previous to the bisulphide poisoning, we may properly attribute the amblyopia to the latter chemical.

As in quinine amblyopia, there are doubtless many cases of transitory amblyopia and partial poisoning unrecognized and unpublished. Of the cases investigated by the British Ophthalmological Society (110) in 1885, twenty-four in all, many were smokers. As typical examples of the eye symptoms in carbon bisulphide poisoning, I have abstracted the following cases. The first was published by Mr. Gunn (111) in 1886; the next two are from Hirschberg's (112) (113). Klinik while the fourth was reported by Becker (114):

CASE I. Thomas W., aged 33, worked continually with bisulphide of carbon as stillman in oil works for fourteen years, and was exposed to

bisulphide of carbon fumes for the last five or six years. The chloride of sulphur is also employed in the works. His general health has failed for the last year; has suffered from aching in the ankles and arms, and pain in the muscles, particularly after walking; loss of appetite, pain in the temples, "a feeling of having had a blow on the top of the head." On two or three occasions, some months ago, he completely lost power over his lower limbs. About four months ago his sight began to fail. He has been married for ten years; within the last eight or nine months has noticed a failure of sexual power. He is a moderate drinker, his average being not more than two pints of beer daily. He smokes one and one-half ounces of strong tobacco weekly, his first morning pipe often making him feel sick. *Present condition:* He is nervous, indeed almost hysterical. His gait is normal, and his knee jerks moderate. Pupils wide, act fairly to light. Tn. He can decipher J. xix c. each eye. Red and green blindness completely, detects blue and yellow moderately well. Field of vision for a while good, very slight peripheral contraction. *Ophthe.* R. O. D. very pale, large vessels of good size. L. O. D. opaque looking, and somewhat pale, large vessels normal.

CASE II. Worker in rubber factory, aged 16, came January 18, 1886. Had worked a year with CS_2 and SCL . At Christmas, vomiting, sulphur eructations, headache, restlessness at night, wandering in mind. Then visual disturbances; R = fingers at twelve feet, L = seven feet. Field of vision normal at the periphery, but there is a large absolute central scotoma with a radius of twenty degrees. Colors are seen outside. Normal fundus. On February 11, the scotoma is ring-shaped, small, and paracentral. On February 22, V., R. = fingers at fifteen feet; V., L. = fingers at seven feet.

CASE III. A girl, aged 26; worked in a rubber factory, and was exposed from two to three hours daily to the fumes of CS_2 and SCL . V. = $\frac{20}{100}$ U. O. Central scotoma for colors, white doubtful. The fundus was normal, but both maculae were stippled and had the peculiar look noticed in the anemic fundi of animals poisoned by naphthaline. Recovery was slow. In six weeks V. = $\frac{20}{30}$.

CASE IV. Reported by F. Becker: A. G., aged 66, worked in a rubber factory on articles which he was obliged to immerse in a solution of chloride of sulphur in CS_2 . First had sweet taste in mouth, loss of appetite, and cramps in the calves of his legs. Then gradual affection of sight. A moderate smoker and drinker. V. = fingers at three meters. Periphery of field uncontracted, but large central scotomata for red, green, blue, and yellow. Temporal half of papilla very pale. In a month V. = $\frac{1}{5}$, but a small scotoma for white remains, and Dr. Becker does not think vision will further improve.

The investigations of the committee (110) appointed by the British Ophthalmological Society, to report upon the subject of bisulphide of carbon amblyopia, led them to believe that it is the inhalation of the vapor, and not the contact of the hands with the chemical that produces the poisonous effects. The earliest symptom, and the most constant one, according to Delpech (15), is severe frontal and temporal pain, as if the head were squeezed in a vise. The workmen attributed this to the smell of the sulphuriz-

ing fluid, and in support of this belief is the significant fact that the only patient of Depech's who had no severe headache was the subject of anosmia. Patient's clothes, breath, skin, and hair have a "rubbery" odor. The *stage of exaltation* (Delpech) presents the following features: Loquacity, vertigo, and a feeling of drunkenness in going into the outside air. Variable spirits and an irritable temper. His appetite is often increased, and he becomes sexually excited. Vision now suffers, he sees objects as through a mist. Hearing is even more frequently affected. Often there is general hyperesthesia. These symptoms are followed by a *stage of depression* when there is anorexia, disturbed sleep, and mental failure. Now there is an anesthesia of the skin, especially of the limbs; cramps, great muscular weakness, impairment of sexual desire, or complete anaphrodisia. Fingers became stiff and numb. Vision is now greatly impaired, fog or mist appearing before the eyes even in broad daylight. Pupils are dilated. The peripheral field is uncontracted, but central negative (and sometimes positive) scotomata are invariably present. Pallor of the disc with indistinctness of its margin often noted.

These symptoms increase in severity as long as the patient is exposed to the poisonous fumes, and finally he loses his memory entirely, and is unable to stand upright.

Of the twenty-four cases reported upon, twenty-two were in men. Their ages varied from 15 to 52, ten being under 25. The *prognosis* is, so far as concerns sight, very fair if the sufferer can entirely give up his deleterious occupation. Of twenty-four cases, eight recorded very good or perfect vision; seven others improved more or less; in five, there was little or no improvement.

A full report by Gallemaerts (115) of a case of amblyopia from carbon disulphide, illustrated by charts of the visual fields, with remarks upon the pathology of the disease, may be found in the *Annales d'Oculistique* for 1890.

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[To be Continued.]

ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY

*A QUARTERLY JOURNAL OF PRACTICAL OPHTHALMOLOGY,
OTOLOGY, RHINOLOGY AND LARYNGOLOGY.*

EDITED BY

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SAINT LOUIS, MISSOURI.

Subscription Price, Including Postage in North America:

PER ANNUM, IN ADVANCE,	. . . . .	\$4.00
SINGLE COPIES,	. . . . .	1.25

SAINT LOUIS, MISSOURI:

VOL. III.

JANUARY, 1894.

No. 1.

CLINICAL MEMORANDA.

A MOSQUITO BITE IN THE MEMBRANA TYMPANI.

By F. C. HOTZ, M. D.,

OF CHICAGO.

ON August 23, a gentleman, aged 40, came to my office to get relief from violent pain in his right ear. On the previous evening, while sitting on the veranda, he felt an insect getting into his ear, and immediately afterwards felt a very sharp stinging pain. He at once poured water into the ear to get the insect out, and its buzzing soon ceased, but the ear continued to ache all night. The inspection revealed on the floor of the meatus, near the membrana tympani, a dead insect which proved to be a mosquito, and the lower half of the anterior portion of the membrana tympani was occupied by a deep red blood blister, evidently

produced by the sting of the insect. The blister was opened, its sanguinolent fluid removed, and a solution of cocaine and boric acid instilled, which gave immediate and permanent relief.

SHORT NOTES OF UNUSUAL CASES.

By WALTER F. CIAPPELL, M. D., M. R. C. S., ENG.,
OF NEW YORK.

SURGEON TO THE THROAT DEPARTMENT OF THE MANHATTAN EYE AND EAR
HOSPITAL.

IN private and hospital practice many cases are met with which differ so much in their etiology, clinical history, and response to treatment, that we are sometimes led to think that we have discovered a new or previously unrecognized condition: on further examination, or as the case progresses, it is usually found that these conditions are only types of diseases already named in our recognized tables of diagnosis. A collection of these very interesting cases have recently been under my observation, and while I am unable to give them all a definite place, they doubtless belong to types of familiar diseases.

Case 1. S. D., aged 23. Six months ago had what she thought was a severe cold in the head, the initial symptoms being chills followed by a temperature of 102° F. Severe pain in the eyeballs, and a tight feeling across the bridge of the nose.

At first the nasal discharge was watery in character, but within twenty-four hours, small white shreddy masses of membrane were blown from both nostrils. At the end of ten days the fever and acute symptoms subsided, and the patient, though weak, resumed her duties. Since this attack the nose has always been troublesome, first one side closing, then the other.

Recurrent attacks of nasal hemorrhage following the discharge of white membranous masses from both nostrils have been of frequent occurrence, and very troublesome.

When examined at the hospital the temperature and pulse were normal, but the patient had a very anemic appearance.

The left nasal fossa contained a white membrane attached to a vascular mass on the septum, about half an inch from the floor of the fossa, at the junction of the middle and posterior third of the septum. A similar membrane covered the posterior end of the inferior turbinated body. The right nasal fossa was packed with sheets of membrane attached to, and covering the turbinated bodies and septum.

Small spots of membrane were also visible on the superior wall of the naso-pharynx. Any attempt at removal of this membrane caused profuse hemorrhage. Three pieces varying in size from one-half to three-fourths of an inch in width, and one-sixteenth of an inch in thickness, were ex-

cised with scissors, and submitted to the pathologist of the hospital for examination. He reported the membrane to be similar in structure to that found in diphtheria, but failed to observe any Klebs-Loefer bacilli.

Douches of weak solutions of bichloride of mercury, creoline, and peroxide of hydrogen were employed to detach the membrane. Failing to remove any by this means, small portions were clipped off each day with the scissors. After the hemorrhage was arrested, saturated solution of chromic acid was applied. This treatment was continued for two weeks, until the nares were free of all membranous material, although it showed some inclination to return at first. An alkaline spray had been used daily during the treatment. About this time a profuse watery discharge became troublesome, and two weeks after the last piece of membrane had been removed, the interior of the nasal cavities had gradually assumed an edematous appearance, which resulted in what is called "polypoid degeneration" of the entire mucous membrane of the nasal cavities, and perfectly occluded them. Many of the polypi were removed with the snare, and after a prolonged treatment the nose cleared of all this tissue. Four months later when the patient called at the hospital, foul smelling scabs packed both fossae, which were removed, and the mucous membrane found to be in a dry atrophic condition.

Case 2. C. R., aged 13. Two years ago had an attack of acute rhinitis confined to the left nasal fossa, which was followed in a few days by a yellow mucous discharge containing flakes of white membrane. The acute symptoms lasted about four weeks when they subsided, leaving the left naris occluded, and it has remained so ever since. The right naris has recently been closed at intervals, and several attacks of difficult respiration have awakened the patient at night.

Occasionally a mass would protrude from the left nostril, and after a few days, recede. When seen by me both nares were completely occluded, and the patient was obliged to keep his mouth open, and spoke with a decided nasal tone.

An examination showed a large, white, leathery mass occupying the position of the left inferior turbinated body, and protruding backwards through the left posterior naris into the naso-pharynx. The anterior and posterior extremities of this mass had a cauliflower appearance, and varied in size at different times. The growth was removed in three pieces with a cold wire snare. The attachment was confined to the inferior turbinated region, and seemed to be a degeneration of, or a growth springing from, the mucous membrane covering the inferior turbinated body.

A microscopic examination, made by Dr. E. K. Dunham, proved the growth to be a fibro myxoma. The base, or attachment, was curetted, and the patient left the hospital. Three months later there was no return of the disease, and the covering of the inferior turbinated body appeared healthy.

Case 3. H. McG. In December, 1892, had "la grippe" which took the form of severe coryza with subacute laryngitis. Since then the senses of taste and smell have been much impaired. Ordinary odors produced no impression upon the left nostril, but she was conscious of a very offensive odor being always present in the nose, or using the patient's own words, she always "smelt herself." Heaviness in the frontal region with tightness.

between the eyes, and mental hebetude were also complained of. The mucous membrane of the nasal fossa looked pale, dry, and leathery. The anterior end of the left middle turbinated body presented an enlarged strawberry appearance, and completely occluded the left fossa. The enlarged turbinated mass was removed, and proved to be expanded bony tissue. Eight days after the operation the patient was able to taste some food; within six weeks both smell and taste were completely restored.

Case 4. E. B., aged 26. About two years ago had a large abscess in the left tonsil. Since then, has had a slight burning pain in that region, running into the ear and extending to the cutaneous surface of the superior and inferior maxillary region, and down the anterior border of the sterno-mastoid muscle. After this condition had existed about a year, similar sensations appeared in the left arm and leg, with occasional attacks in the left ovarian region. On rising in the morning the burning pains were very slight, but as the day progressed they increased and reached their height between the hours of one and three p. m. They then gradually subsided. During the attack the left cheek becomes red, and the patient erratic and restless in her manner. At my first examination I found the temperature 100 F., and the pulse 120. Every organ was carefully examined by myself and colleagues without finding any organic trouble or anything to account for her condition. The observations extended over a period of eighteen months, and the temperature was taken every other day during that time, and daily for three months without ever finding it below 99 F. or above 101 F.

Treatment for malaria, rheumatism, and several other conditions which it was suggested might be the cause of this neurotic state was given thorough trial; nothing influenced the attacks or temperature in the slightest degree excepting prolonged rest. This gave temporary relief, but a return to moderate employment renewed the attacks.

Case 5. Mrs. D., aged 66. Although physically strong, comes from a nervous stock, and is of a neurotic temperament. Has always had some throat trouble. When 26 years of age her uvula was amputated. Immediately following the operation a severe attack of difficult respiration came on which the patient called "spasm of the throat." A similar attack followed the use of a probang some years later, and after several nervous shocks she suffered from modified attacks of the old trouble. Mrs. D. came under my care in March, 1893, complaining of a constant desire to clear the throat, and a feeling of fullness at the root of the tongue. The mucous membrane of the pharynx and larynx was found congested, and the circulation sluggish. For several days I sprayed the throat with Dobell's solution without any difficulty. On the eighth day, when about to use the spray, Mrs. D. jumped from my office chair, and clutching her throat, ran into the adjoining room and dropped on the floor. Violent efforts at respiration began and continued for some moments without any effect. The face became pallid, and large drops of perspiration broke out all over her body. Ordinary means failing to provoke inspiration, I touched her forearm with the point of a Pacquelin cautery at a white heat. This produced an immediate inspiratory effort and after several applications of this kind respiration was fully established. Two hours later a burning sensation was felt behind the soft palate and extended to the larynx and trachea. This was accompanied by a hacking cough, and a very restless condition. These

symptoms subsided in about twenty-four hours, with the exception of a stinging sensation in the larynx which continued at intervals for more than a week.

When a Pacquelin cautery is not at hand, Dr. A. H. Smith suggests the use of the closed end of a test tube, heated by a spirit lamp. He has found it a very efficient impromptu counter-irritant.

Although the Klebs-Loeffer bacillus was not observed in my first case, it seems most probable that it was one of nasal diphtheria extending over a period of several months. Membranous rhinitis is said not to continue longer than four weeks at the outside.

The attachment of the membrane, and its efforts at reformation, are characteristic of diphtheretic membrane only.

During the treatment of this case, one of my assistants and myself had several short attacks of pharyngitis. From inquiries made among the patient's friends, I found that many of them had suffered recently from sore throats of more or less severity.

The acute edematous condition of the mucous membrane and its subsequent polypoid degeneration, was a very unusual experience for me, and the present atrophic state is also interesting, being probably due, in part, to traumatism.

The second case is similar to the first in early history, but on comparison it seems most probable that it was one of membranous rhinitis confined to the left naris, followed by a chronic inflammation and subsequent transformation of the mucous membrane of the inferior turbinated body into fibro-myxomatous tissue. When removed, this growth showed no disposition to return.

Anosmia, as in my third case, is not infrequent, as a result of hypertrophies and nasal growth, but the presence of parosmia at the same time, and seemingly due to the same cause, appears to be an uncommon experience, as is also the perfect restoration of the impaired senses after such a combination.

22 East Forty-Second street.

REPORT ON PROGRESS—OPHTHALMOLOGY

ABSTRACTS FROM OPHTHALMOLOGICAL PAPERS
APPEARING IN CURRENT AMERICAN AND
ENGLISH JOURNALS.

BY CHARLES H. MAY, M. D.

CHIEF OF CLINIC, EYE DEPARTMENT, VANDERBILT CLINIC, COLLEGE OF
PHYSICIANS AND SURGEONS, NEW YORK: PROFESSOR OF DISEASES OF
THE EYE AND EAR COLLEGE OF PHYSICIANS AND SURGEONS,
BOSTON; ETC.INDIRECT MASSAGE OF THE LENS FOR THE ARTIFICIAL
RIPENING OF CATARACT.

Dr. Jackson (*N. Y. Med. Jour.*, Oct. 23, 1893.) reports his test of the method suggested by Dr. T. R. Pooley. (*N. Y. Med. Jour.*, Dec. 26, 1885.) in seven cases. The method consists of a preliminary paracentesis of the anterior chamber, and the massage of the lens through the collapsed cornea by the means of a tortoise-shell spatula for one and one-half to two and one-half minutes. He summarizes his conclusions as follows: "It seems more certainly efficient than Förster's. It is almost entirely free from danger. It is probably a better means of avoiding prolonged practical blindness than the extraction of the immature cataract."

EXOPHORIA CURABLE WITHOUT OPERATION—AN ADDITIONAL
WORD AS TO THE TREATMENT OF EXOPHORIA.

George M. Gould, A. M., M. D., Philadelphia—*Medical News*, October 14, 1893, and November 18, 1893.

The following represent the essential points in these two very interesting papers on a subject which seems to be occupying more and more space in ophthalmological literature. The writer states: "My experience shows that every case of exophoria, (and possibly of divergent strabismus), is certainly and quickly curable by a rational and common method of ocular gymnastics, and absolutely without operation." After pointing out "the absurdity of cutting a relatively strong, but in reality not over-strong muscle, in order to give its weak counteracting muscle more strength relatively,"

he calls attention to many facts "going to show that, at least primarily, the fault cannot lie wholly, or chiefly, and generally not at all, with the length, strength or weakness of the muscles, *qua* muscles, but it is largely, if not entirely, dependent upon innervation and innervational coördination," * * "I have sought to break up the bad habit of exophorial innervation, to re-establish normality in an erroneous nervous coördination, to heighten convergence-stimulus, and to carry this increased stimulus as well as the naturally lightened stimulus of convergence at near range, into distant and all-round seeing." This method, he calls "the weighted convergence-stimulus, carried from the near point to the distant point." Determining the power of adduction at twenty feet, in a great majority of cases of subnormal adducting power, he finds that the "weighting" or "handicapping" by prisms, bases out, is at first about double the primary twenty foot adduction power; if the patient has only 10°, we may safely give, at first, 20° prisms (total). "Let the patient first fix upon a small bright object or $\frac{20}{40}$ test-letter, held at a distance of twelve inches from the eyes, then slowly carry this object from the near point to the distant point. This is to be repeated until the eyes with 20° prisms can hold objects all about the room easily. The repetition is to continue several times daily until this increased adduction power is *habitual*, and until no diplopia is produced on first adjusting the prisms, and looking at distant objects immediately. When this condition has been reached, the strength of the "handicap prisms" is to be increased say, to 25° or to 30°, and the method resumed as before. Before an adduction power of 30° has been reached, the symptoms of asthenopia will long have vanished. The treatment with 30° or 40° prisms should be continued until all manifest and latent exophoria has disappeared, and 2° of esophoria have become manifest." Regarding the "durability and perpetuation of once-gained normality," he says: "I have been delighted to find how steadily it is maintained. * *. I have had no relapses so far, although I frankly confess that my oldest cases cured by this method have been only a few months out of my hands. Their reflex symptoms, however, disappeared before the return of muscular coördination, and subsequent retests show no tendency to revert to the old disorder."

THE PRESCRIBING OF PRISMS.

Ernest F. Maddox, M. D., Edinburgh—*Ophthalmic Review*, February, 1893.

This instructive paper is well worth careful reading. In it Maddox describes a modification of the rod which bears his name:

“The best form for use is a series of small glass rods about an inch long, arranged parallel to each other, and in close contact. Any one can make this for himself by breaking up a long glass rod about one-eighth of an inch in diameter into short pieces of equal length, laying them side by side on a hard surface to get them perfectly level, and then fixing their ends with sealing wax. The advantage of this form is the ease with which it is held opposite the patient's pupil, for one of the rods must be in front of it.”

A NEW PHOROMETER.

A. E. Prince, M. D., Springfield, Illinois—*Archives of Ophthalmology*, July, 1893.

THE BEST FORM OF CYLINDER TEST AND VARIABLE PRISM WITH A NEW PHOROMETER.

Journal of the American Medical Association, November 11, 1893.

THE ROD TEST WITH THE ROTARY VARIABLE PRISM

Edward Jackson, A. M., M. D., Philadelphia—*Ophthalmic Review*, August, 1893.

Both of these instruments consist of a Maddox cylinder combined with a single or double rotary prism. The advantages of these new phorometers are that they possess all the good points of the older instruments, and in addition are simple, inexpensive and delicate to a fraction of a degree. They are fitted into a handle, and require no expensive stand or leveling apparatus.

AN INSTRUMENT FOR THE RHYTHMICAL EXERCISE OF THE OCULAR MUSCLES—THE PHOROTONE.

H. McI. Morton, M. D., Minneapolis—*Medical Record*, October, 14, 1893.

This instrument consists of two sets of superimposed discs provided with prisms so arranged by the power of neutralization that any or all sets of ocular muscles can be exercised at will: the exercised muscles are exposed to one period of action followed by two of repose, the exercise consisting of alternate contractions and relaxations.

ATROPHY OF THE OPTIC NERVE AS A SYMPTOM OF CHRONIC DISEASE OF THE CENTRAL NERVOUS SYSTEM

Thomas Buzzard, M. D., F. R. C. P.—*British Medical Journal*, October 7, 1893.

The writer finds atrophy of the optic nerve most frequently associated with insular or disseminated sclerosis, next frequently in connection with fasciculated sclerosis of the posterior columns (in tabes and general paralysis of the insane), least often with

fasciculated sclerosis of the lateral columns. He found atrophy in forty-three out of one hundred cases of disseminated sclerosis of the posterior columns, thus corresponding with the results obtained by Uhthoff (48 per cent). Visual impairment varied very much, was very often unilateral, and when bilateral, was not symmetrical and rarely terminated in complete blindness. Many cases showed *concentric* diminution of the field both for white and for colors. Such contracted fields should make us hesitate in diagnosing "hysteria" even though there are no appearances of atrophy of the optic nerve, for often in such cases, a change in the nerve which ultimately ended in atrophy, subsequently showed itself.

Among 156 cases of *tabes* he found fifteen cases of discs with atrophic changes. There is, apparently, no constancy in the character of the visual field in *tabes*. "Concentric shrinkage is observed, or the limitation may sometimes be temporal, in other cases nasal. Central scotoma would appear to be exceptional." He concludes as follows: "Are not many of the cases of the retro-bulbar neuritis of ophthalmologists really examples of the "hysterical" form of disseminated sclerosis, the type in which, in its early stages, the characteristic symptoms are either entirely absent or but feebly expressed?"

GOUTY RETINITIS, CHORO-RETINITIS AND NEURO-RETINITIS—

Charles Stedman Bull, M. D., New York—From the Report of the Twenty-Ninth Annual Meeting of the American Ophthalmological Society—*Boston Medical and Surgical Journal*, November 23, 1903.

The paper was based upon the study of the retinal changes found in over one hundred cases of gouty patients. Five of these cases (two with autopsies) were reported in detail. The points to which attention was drawn were: "1. The changes in the fundus were always bilateral though rarely symmetrical in the two eyes. 2. The degeneration in the walls of the blood vessels and in the retina cause marked impairment of the central vision, little or no impairment of peripheral vision, and never end in blindness. 3. The loss of central vision is always progressive up to a certain point, unless the cause of the disease is recognized early in the outset, and immediately and properly handled. Improvement of the vision after the disease is established cannot be expected. 4. Hemorrhages into the retina are rare except in the beginning of the disease. Their absence later is probably due to the fact that the strength of the vascular wall is increased by the deposit though

its elasticity is diminished. 5. The most marked feature in the fundus is the development of the arterio-sclerosis and the phlebo-sclerosis. This is seen by the ophthalmoscope in the vessels of the retina, and the microscope shows that the degeneration exists as well in the vessels of the choroid and optic nerve. 6. Another almost equally pathognomonic symptom is the peculiar yellowish granular exudation in the retina, located by the ophthalmoscope around the posterior pole of the eye, and generally leaving the macula intact, and proved by the microscope to be mainly in the nerve-fiber layer, though formed in all the layers except that of the rods and cones. 7. The changes in the optic nerve fibers seem to be almost entirely intra-ocular, and cannot be traced for any great distance back of the eyeball."

ABSTRACTS FROM FOREIGN OPHTHALMIC JOURNALS.

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FACTS RELATIVE TO THE DEVELOPMENT OF MYOPIA, WITH DISCUSSION. THE TREATMENT OF CORNEAL ULCERS AND ABSCESES BY CURETTING AND IRRIGATION, WITH DISCUSSION. ON ECZEMA OF THE LIDS. THE ACTION OF SCOPOLAMINE UPON THE EYE; AN ATROPINE SUBSTITUTE. CYANIDE OF MERCURY IN OCULAR THERAPEUTICS, WITH DISCUSSION. A NEW TREATMENT OF GLAUCOMA. EXTRACTION OF THE TRANSPARENT LENS IN HIGH DEGREES OF MYOPIA. WITH DISCUSSION.

On August 7, 8, and 9, was held the twenty-eighth meeting of the Heidelberg Ophthalmological Society; while, earlier in the year (May 1, 2, 3, and 4), the Eleventh congress of the French Society of Ophthalmology sat in Paris. The transactions¹ of these important societies furnish us with many interesting papers, some of which, in abstract, I desire to present under the heading of this review.

The reading of a paper often elicits discussion of a kind quite as interesting as and sometimes more valuable than the matter contained in the original contribution. I have, consequently, translated as much of these criticisms and additions as I think will be of interest to readers of the ANNALS.

Facts relative to the development of myopia. SULZER. Numerous observations have demonstrated that the prolonged exercise of the eyes at a near point does not necessarily produce short-sightedness. Watchmakers, for example, who are continually using their ocular muscles and straining their eyes while making accommodative and convergent efforts, are not especially myopic.

¹ Bulletins et Mémoires de la Société Française d'Ophtalmologie. Onzième année, 1893.

Bericht über die Versammlung der ophthalmologischen Gesellschaft. Heidelberg, 1893.

In the schools, on the contrary, many examinations have taught us that myopia goes hand in hand with the use of the eyes for near work. I was astonished to find in the schools of Geneva that short sight is, in the beginning, almost without exception, unilateral. If later on, it becomes binocular, the majority of cases continue to show an unequal degree in the two eyes. Scholars and watch-makers maintain different attitudes during their work; the latter place the object directly in front of them so that it is the same distance from each eye; the former, engaged in writing English script, incline the head sometimes to the right, sometimes to the left. This position of the head is due to the tendency of the scholar to give to the basal line a position perpendicular to the inclination of the writing. Thus, 60 per cent of the students aforesaid preferred to hold their heads to the right; 40 per cent incline them to the left. Sixty per cent were found to be more myopic in the left eye than in the right, while 40 per cent were more myopic in the right eye than in the left. It is not possible to explain this as a mere coincidence. It seems to me to permit of but one explanation: it results from an inclination of the head which places the point fixed at unequal distances from the two eyes. To obtain equally distinct images in both eyes, under these conditions, the child must, if necessary, make unequal accommodative effort in each eye. Permit me to cite some figures. In the case of a child whose attitude (which we may call good) during study is such that one eye is 35 cm., and the other 33.5 cm. from the object, the accommodative difference is 0.173 D. In the second or *mediocre* class where the eyes are distant, respectively, 24 and 19.5 cm. from the fixed point, the difference equals 0.97 D., while in the *worst* attitude, 12 and 9.75 cm., 1.87 D.

We now know that unequal accommodative effort in the two eyes is physiologically impossible, and, as shown by the evidence of the schools, the eye further removed from the fixed point relieves its accommodative struggle by becoming elongated.

School myopia then may be considered as the outcome of an adaptation of the visual apparatus to a vicious attitude induced by writing inclined script, an adaption in the interests of binocular vision. *The introduction of perpendicular script will be the most effective prophylactic against the progress of school myopia.*

ROMULE (of Liège) said, that as opposed to the 25 per cent of myopia found by Mr. Despagne in certain Paris schools, he had found in the common schools of Liège only 0.7 per cent of myopia among the boys and 1.74 per cent among the girls. He had been

able to establish a considerable diminution of the number of myopes as compared with former examinations made during 1881, in the State normal school and the Girl's Orphanage.

He believed the chief cause of myopia to reside, not only in the case of schools but of individuals also, in insufficient illumination. In Liège house-lighting is excellent; the lamps in use are very good, while petroleum, which in Paris costs from 70 to 80 centimes a litre, can be bought in Liège for 11 centimes. He asked whether the principal reason for this great difference in the proportion of myopia in the two countries is not the outcome of differences in the illumination.

MARTIN. The causes which our colleagues have just advanced are doubtless effective in the production of myopia, but they are relatively of minor importance. The question of race, and especially of temperament, seems to dominate all other causes. The use of the eyes for near work brings about in persons of a certain temperament a ciliary spasm which directly produces an axial myopia. My researches allow me to assert that spasm is a constant factor in the production of near-sightedness.

The causes of myopic spasm are such as produces an exaggerated accommodative effort (defective light, vicious positions of the body or head in school, astigmatism, prolonged work), but these causes alone are not sufficient, except in those predisposed to it. Again, such a spasm is likely to follow an ocular traumatism, a keratitis, or some such debilitating disease as typhoid fever, measles, influenza, etc.

In my opinion, prophylactic treatment should consist in augmenting those forces that, generally speaking, resist disease. We make our children begin their studies at too early an age: we allow them too many hours of study and not enough exercise.

VIGNES. *Apropos* of spasm of the accommodation, M. Bel-liard and M. Dianoux have reported to the Paris Ophthalmological Society some very interesting observations made in Nantes. A large number of young scholars were found to have had accommodative spasm, followed later on by myopia. Following the advice of M. Dianoux, the school illumination was improved, and the spasm of accommodation completely disappeared. These are instructive facts as bearing upon defective lighting as a forerunner, first of accommodative spasm, and finally of axial myopia.

Having myself examined a number of Paris school children I was struck by the large proportion of anisometropes, a fact in accord with M. Sulzer's observations. I trust when we shall have

obtained such reforms in our own Paris schools as M. Romi  e has fortunately been able to introduce into the schools of Li  ge, that our statistics will at least resemble his, especially as our race is much less predisposed to myopia than our neighbors.

MOTAIS. I have examined, during eleven years, more than 5,000 pupils from the colleges and schools of West Central France, and I am convinced that myopia is not a question of race. For example, its marked development in Germany means that instruction is more widespread in that country and extends over a longer time. Its production has affected a larger number of generations, and the influence of heredity is consequently the most potent factor.

The treatment of corneal ulcers and abscesses by curetting and irrigation. DEWECKER. I believe that the treatment of corneal ulcers by such methods as the Saemisch section and cauterization will eventually give way to scraping with small and sharp curettes. Snellen, *p  re*, and Badal after having, like myself, followed this plan, are declared partisans of it.

The advantage of scraping lies in the preservation of healthy tissue which would be destroyed by the use of the cautery. The object of this novel procedure consists in the substitution of healthy for infected walls in the ulcer or abscess, which are afterwards preserved in their normal condition and kept from subsequent infection by an appropriate antiseptic treatment.

The details are as follows: we attack the ulcer or ulcerating abscess with our small curette until all the infected tissue has been removed; this is followed by a plentiful, and long-continued irrigation with boric acid solution (4 per cent), finally an antiseptic bandage.

VACHER. For some time past I have been in the habit of using the curette, and following it by irrigation with boiled water. I prefer it to mercurial solutions which produce haziness of the cornea.

DESPAGNET. I consider the curetting of ulcers in general, as a surgical procedure of great value, still I am constrained to ask M. deWecker, in regard to corneal ulcers, what he considers are the precise indications for the operation, and what are its dangers? Because, in operation on such a limited surface, and on such a thin membrane, it seems to me quite possible to exceed the limit of the diseased tissues and to render the situation worse than before the surgical interference.

From the standpoint of their extent I divide corneal ulcers into two classes, superficial and deep.

The first affect only the superficial layers, the epithelium and Bowman's membrane. I do not think M. de Wecker would recommend the scraping treatment for them. Indeed it is practically impossible to measure the penetration of the curette by tenths of a millimeter so as not to injure the true substance of the cornea. When the latter is injured a scar invariably follows. Avoiding this, superficial ulcers undergo repair without any cicatrix.

As to deep ulcers, I can well believe that scraping would modify their course, but again, is there not a real danger of perforating the cornea and so bringing about evil results which we would gladly avoid?

GILLET DE GRANDMONT. In the treatment of these ulcers, there are at least two rational procedures, scraping and irrigation. I will speak of the latter only. Instead of liquids I make use of a gas, oxygen, under a pressure of 150 atmospheres, and this gaseous douche has the important advantage of thoroughly cleansing all the minute cavities and anfractuosités of the ulcer.

GALEZOWSKI. Spreading ulcers of the cornea are always accompanied by an anesthesia of the parts, and for this reason all irritating applications should be avoided. For this purpose I apply a simple dressing entirely covering the affected eye, and, as a complement to this, introduce some antiseptic gelatine discs, renewing the dressing once in twenty-four hours.

VALUDE. As long ago advised by myself, and others, the ocular dressing to be really exclusive (*occlusif*) should be kept continuously in place not for twenty-four hours, but for several days. Consequently, cases treated by M. Galezowski's plan would not receive the full benefits of the treatment by occlusion.

M. DEWECKER, in reply, said that so far he had very rarely entered the anterior chamber and that superficial ulcers healed very rapidly and satisfactorily (as regards cicatrices) after scraping. He congratulated M. Valude on having popularized the occlusion method, and thought that the use of the sharp curette, followed by irrigation and the exclusive dressing, constituted a most complete and excellent method for the treatment of corneal ulceration.

[It seems strange that in the foregoing discussion no reference was made to the value of the aniline dyes in determining the limit and depth of corneal ulcers. It appears to me that in such cases, especially for determining the boundaries of irregular, spreading ulcers, they are indispensable. Without the aid of blue pyoktanin, green fluorescin and some other stains, there is certainly much to

justify M. Despagne's criticism of the scraping (with a *sharp* curette) treatment of all forms of ulcer. With the help, however, of a staining fluid that clearly outlines the affected tissues and reveals their extent, curetting, as many American surgeons have testified, is a very valuable procedure. C. A. W.]

On eczema of the lids. TROUSSEAU. Palpebral eczema is an affection distressing to the patient and discouraging to the surgeon on account of its obstinate character, its successive attacks, and its frequent exacerbations. It is always accompanied by a special form of conjunctivitis, which we may call *conjunctivitis eczematosa*, characterized by an irritating catarrhal secretion, more or less marked, which seems to intensify and aggravate the dermal lesion.

Finding that the latter affection did not yield to milder means, (zinc sulphate, silver nitrate, etc.), I have successfully employed conjunctival irrigation with a non-alcoholic solution of corrosive sublimate, beginning with 0.05 gm. and gradually increasing to 0.25 gm. in 500 gms. of water. I soon found that the march of the cutaneous disease was impeded by the application of warm compresses immersed in the same solution. I have succeeded by this means in curing cases, affected by eczema for a long time, that had received no benefit from a great variety of other methods of treatment. I was led to try this remedy in consequence of my belief in the parasitic nature of the disease.

If the eczematous surface be much irritated one can apply a starch poultice prepared aseptically.

Ointments often do harm and may provoke an extension of the disease. One should never use them except at the end of the attack after desquamation has ceased, and then only with the greatest caution, using such non-irritating excipients as pure vaseline, with bismuth, zinc oxide, ichthyol, yellow oxide, etc. Here, of course, is an opportunity for the display of medical tact.

*The action of scopolamine upon the eye.*² L. BELLARMINOW has made a number of observations upon eyes under the influence of this new mydriatic, lately introduced by Raehlmann. These experiments were made upon both healthy and diseased eyes, with the following conclusions: scopolamine is, generally speaking, indicated in cases where one would employ atropine, and especially for the determination of refractive error and accommodative anomalies in those cases where a rapid and complete paresis of the

² *De l'action de la scopolamine sur l'oeil.* Revue générale d'ophtalmologie. No. 7, 1893. From the Russian (Wratch No. 17, 1893) by M. Chodin

ciliary muscle is required. The period of cycloplegia and mydriasis is considerably shorter than when atropia is employed. The new drug is to be preferred to atropine in the milder forms of corneal inflammation, and in general, where the morbid condition is likely to disappear before the disagreeable effects of atropine pass off. The scopolamine seems to possess all the good qualities, and lacks many of the bad qualities of atropine. For these reasons the writer believes that it will, in time, displace atropine in the practice of the oculist.

Cyanide of mercury in ocular therapeutics. SCHLÖSSER. Following Chibret, I have studied, during the past year, the curative and other effects of potassic cyanide, especially in comparison with mercuric chloride, and I believe that the irritation set up in the eye by the latter is about four times as great as when the cyanide is employed. Potassic cyanide does not, to any extent, coagulate albumen which, as every one knows, is abundantly precipitated by corrosive sublimate. Finally, instruments are unaffected by the cyanide.

Clinically, I have also had experience of the remedy, especially in infective conditions. I have applied to the everted lids a 2 per cent solution in cases of acute conjunctivitis with a rapid decrease of the secretion.

In thirty-seven cases of purulent dacryocystitis, acute and chronic, irrigation with the same solution has given good results. Three patients with chronic blennorrhœa of the sac have been cured in this way, and for nine months there has been no appearance of a return of the disease.

SEGGER. I have had a similar experience with the oxycyanide of mercury, and I have observed that in conjunctival inflammation the purulent secretion has rapidly disappeared under its use in solutions which, by the way, need not be very strong.

A new treatment of glaucoma. KNIES. I have succeeded in diminishing the liability to accident in operations for glaucoma by making my corneal incision very peripheral so as to include the iris in the section. This *iridosclerotomy* is of especial value in the acute forms of glaucoma. Thus the danger of hernia of the iris—an accident that not infrequently follows the ordinary sclerotomy—is very much reduced. The operation is indicated in all cases of glaucoma where iridectomy would be of value.

Extraction of the transparent lens in high degrees of myopia. FUKALA. [Some years ago I translated for the *American Journal of Ophthalmology*.³ Fukala's original paper on this subject.⁴ I would

refer my readers to this article for necessary details. I also reported a few cases where, for its optical effect, the operation was done by my late partner, Dr. W. F. Smith, and myself. Since that time I have been able to repeat the operation with gratifying results, and although my experience has been limited. I would recommend Fukala's operation in suitable cases and especially in young subjects. The criticisms by other members of the Heidelberg Society of Prof. Fukala's paper, given here, will show how the innovation is regarded in Europe where opportunities for its employment occurs more frequently than in this country. C. A. W.]

It is necessary, in considering the operative treatment of myopia, to determine whether a patient having an excessive amount of nearsightedness, retains and can maintain with it good and useful visual acuity, or whether the conditions are such as to render it impossible for him to do effective work. For, only in the latter case, should the operation be performed to enable the sufferer to gain a livelihood. The operation should only be undertaken in adults who have at least 14 or 15 D. of M. Children having as little as 10 D. may be operated upon, since in these cases the myopia will probably increase. In myopia above 14 to 18 D. only one lens should be removed: in myopia above 18 D., both lenses.

The visual acuity improves from twice to four times that which the eye possessed before the operation. In one case where M. = 20 D. vision was $\frac{1}{30}$ before and $\frac{1}{2}$ after the removal of the crystalline. Finally, the refraction has remained without change, or, at least, has done so in my cases up to date. In persons whose single eye has been operated upon the refraction continued unchanged in that eye, while in the other eye the myopia had increased. Up to the present time my experience includes thirty-seven cases and I have not had a single mishap.

VOX HIPPEL. I have operated upon several subjects affected by high myopia: a young workman with 18 D. and a low visual acuity; a young girl, myopic 16 D.; a child, aged 7, with 20 D. There was no inflammatory reaction, and several days after the dissection I removed the soft cataractous masses. I did not do an iridectomy. I have not noticed any increase of visual acuity, the myopia is simply reduced (according to Fukala 16 D.—Trans.) by the removal of the lens or transformed into a greater or less

³ November, 1890, Vol. VII, page 347.

⁴ *Operative Behandlung der hochstgradigen Myopie durch Aphakie.* Graefe's Archiv für Ophthalmologie, Bd. XXXVI, 2.

degree of hypermetropia. I feel certain that it is quite safe to operate in spite of the presence of choroiditis, but I am unable to decide whether the progress of the myopia is retarded by the extraction of the lens.

FUKALA. It is necessary to wait sometime after the operation to allow the visual acuity to re-establish itself. I believe that children, even those with as high a degree of myopia as 15 D., are eventually able to accommodate.

THIER. I am able to speak, in this connection, of five patients who underwent nine operations with good results, except in the case of a man, aged 40, whose visual acuity was only temporarily improved. All the others were permanently benefited.

In one myope of 13 D. the refraction was transformed into hypermetropia of 3.5 D. and had vision of $\frac{3}{30}$ improved to $\frac{5}{6}$. This was an engineer who, after operation, was able to resume his occupation.

A young governess, who found herself obliged to give up her work, was subsequently able to resume teaching. A young workman with M. of 18 D. had his vision raised from $\frac{5}{60}$ to $\frac{5}{30}$ to $\frac{5}{10}$.

I practice discission without iridectomy, removing the softened masses in from three to thirty days after the needling.

SEGRIST. I have been able to observe the patients operated upon by Pflueger, who has extracted the transparent crystalline twenty-seven times, and I did not notice the increased acuity of vision claimed to set in immediately after the operation. The patients are generally satisfied with the results.

In all the cases, except two, the extraction was done in one eye only. An increase of visual acuity was always noticed in every case, but it did not show itself until several months had passed.

The operation consists in discission, followed by repeated corneal punctures, for the expulsion of soft lenticular masses. Several months afterwards the patient returns for discission of the secondary cataract, subsequent to which existing refractive errors, especially astigmatism, are corrected.

VALUDE. I have done this operation twice under the following circumstances: The first patient was a child about 10 years of age (I reported this case last year) who, having a myopia of from 16 to 18 D., could not continue his studies or learn any sort of trade. I removed both lenses by different methods, and without iridectomy, at an interval of fifteen days. On one side I employed discission with a subsequent evacuation of the lenticular masses but in the other eye I did the ordinary extraction operation, fol-

lowing it by a discission for secondary cataract. The immediate results, objective and optical, were perfect in both eyes and lasted several months. At the end of that time, however, the eye upon which the simple extraction had been done became affected by retinal detachment. The disease increased, became total, and terminated in atrophy of the globe.

I saw this child within the last few weeks. (the operation was done two years and a half ago), and found the following conditions present: the eye treated by discission, hitherto in good condition, has now blurred vision. I was able to discover at the periphery of the retina a peculiar cloudy appearance, indicative of detachment. There was no change in the refraction.

My second patient is a man about 40 years of age who has a progressive myopia of 18 D. In consequence of this affliction he was no longer able to work and came to me for a certificate that would admit him to hospital. I wished to help this unfortunate, still healthy and in the prime of life, so I did a discission, followed by evacuation, on both eyes at an interval of two weeks. This time I combined the treatment with iridectomy. The result was very good, the man was able to work and to read, and that happy state of affairs has continued for a year.

Here, then, we have two cases, essentially different. In my judgment, Fukala is right in defending a procedure that will rescue certain myopes from misery and semi-blindness. I believe with him that the operation should be reserved for cases of absolute necessity. To the dangers which attend it, as illustrated by my first case, we are not justified in exposing myopes who possess a measurable degree of useful vision.

RAEHLMANN. I consider it dangerous to operate on myopes with disease of the fundus. Variation of the intra-ocular pressure in such cases is extremely dangerous.

FUKALA. The improvement in the visual acuity being mainly due to the displacement forward of the nodal point we shall have a good result if the operation has been uncomplicated and the choroidal changes are not serious.

HORSTMANN. I operated five months ago upon two young patients whose condition appeared to me to justify surgical interference. The result is subjectively satisfactory, and vision is improved.

I did a simple discission, and allowed the crystalline masses to undergo spontaneous absorption.

THIER. I have always found better results from operating on

children than on adults, but I advise in all cases that both eyes be treated. I do not attach much importance to increasing the intra-ocular tension, since I have never seen it last, even in a case where absorption occupied thirty-three days.

SIEGRIST. I have myself noticed plus tension in these cases, but a single instillation of atropine was sufficient to relieve it. My chief, Prof. Pflueger, operates only on patients under 40 years of age who present no choroidal complications.

OTOLOGY.

ABSTRACTS FROM FOREIGN OTOLOGICAL CURRENT LITERATURE.

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AMONG the interesting subjects discussed by Grunert¹ are the site of predilection for caries in the middle ear, based upon the observation of cases operated upon by the Stacke method in the Halle clinic. The importance of the attic has always been recognized, while caries of the floor has received heretofore but slight attention, although *a priori* we would expect caries of that part of the middle ear to which the pus gravitates. A second place is the *aditus ad antrum*, particularly its lateral wall (twice only in one hundred cases was the median wall attacked). Caries of the promontory is almost invariably superficial, exfoliation of portions of the cochlea was observed only twice. The facial nerve was exposed through caries of the wall of the Fallopiian canal several times, and always where the nerve makes its last downward turn. Once the silver tube could be introduced into the canal opened by caries, and in this case the paralysis which existed before the operation disappeared immediately. The simple smooth, paper-like variety of cholesteatoma was more frequent than the large cholesteatomatous tumor. The process, of whatever sort, was almost

¹ Grunert. Stacke's operationsmethode zur Freilegung der Mittelohrräume während des zweiten Jahres ihrer Anwendung in der Kgl. Ohrenklinik zu Hall a. S.

never limited to the attic, but was repeated in the antrum. In one case the outer semi-circular canal presented a fistula, from which pus came. It is noteworthy that here the patient's ability to retain his equilibrium was not affected.

A case of particular interest, as showing that middle ear processes may be cured, while at the same time a purulent inflammation may be extending from the antrum, is related. When the obstructing polypi were removed by the snare it was seen that they had broken through the posterior wall of the external meatus from the antrum, and that the antrum was the source of the pus which appeared in the external meatus. The membrana tympani presented a scar, showed no evidence of existing inflammation, and inflation with the Eustachian catheter gave a normal sound. Whispering was heard at five meters.

The operation confined to the opening of the attic alone is no longer done in Halle, because, as was shown by all the cases in which the mastoid antrum was also opened, the process was practically the same there. To the neglect to open the antrum *with* the middle ear, Grunert attributes the failures which have occurred. In the two cases so operated upon, and remaining cured, he suggests that a simple hammer and bone extraction might have answered. The usual procedure in the radical operation—a preliminary opening with the chisel, the introduction of a probe through the editus into the middle ear, and the removal of wedge-like pieces of the posterior wall of the bony meatus—was modified only when the sinus transversus was situated so far forward that it was impossible to penetrate the antrum between the sinus and the posterior wall of the meatus, and in the second place, when the antrum was the seat of the trouble, the process in the middle ear having healed. When the sinus was placed so far forward, the antrum was opened from within by the removal of concentric lamellæ from the posterior wall of the meatus. (In one case the lamellæ of bone separating sinus from canal was scarcely 2 mm. thick). In the cases in which healing had taken place in the middle ear, that was left undisturbed, while the rest of the operation was done as usual.

The large cavity is to be carefully cleansed of bone particles, and projecting angles smoothed, in order that the after treatment and the covering of the cavity with epidermis may be facilitated. The two flaps made from the posterior wall of the meatus were repeatedly used to cover the sinus transversus, or dura mater. They were shaped accordingly. In the after treatment necrosis of

the cortical portion from which the periosteum had been removed was usually prevented by drawing back again the periosteum or the temporalis muscle which had been pushed out of the way, and fixing them in place with a few stitches. The greatest hindrance to the extension of the epidermis covering over the operation cavity, were, in the first place, the sharp angles left in the cavity, and secondly, callous thickening of the margin of the epidermis. The means of avoiding the first of these has been mentioned already. The skin margins are cauterized with nitrate of silver, or the galvano-cautery. Grunert prefers the latter, both for this purpose, and when treating granulations as well.

Of great importance is the gauze tampon, which is, in the early treatment, tightly packed into the cavity. Later, usually in the eleventh or twelfth week, the covering with epidermis will proceed much more rapidly if the tampon is more loosely inserted. Aristol, as a mechanical protection for the new epidermis, is praised. Fissures in the meatus wall are best avoided by careful extraction of the tampons. A tendency to eczema of the new covering is corrected ordinarily by a single application of a one per cent solution of nitrate of silver. The average duration of the treatment was four and a half months.

Of the one hundred cases of which records have been published by Grunert and Panse, fifty-eight have been cured.

By reason of the increasing attention which the stapes is receiving at the present time, it has been thought advisable to report at greater length Bezold's case, which was briefly mentioned in the last number of the ANNALS.

Removal of the Stapes. Bezold. (Munich), Zeitschr. f. Ohrenheilk., XXIV, 4, October, 1893.

Mrs. C. K., aged 48. Impairment of hearing in both ears for many years. Constant tinnitus for one year. On both sides evidences of suppurative disease of middle ear, with persisting perforations. No discharge at present. Extraction of stapes on right (poorer) side, under cocaine anesthesia. Hearing distance before operation, whispering 2 cm., conversational voice 20 cm. After hooks of various sorts were unsuccessfully tried, the stapes was removed with fine dressing forceps. No flow of serum followed, but at the moment of extraction the patient sank with a sigh on the left side, became colorless, and broke into a perspiration. No loss of consciousness. Immediate test of hearing appeared to show improvement. Great vertigo on attempting to stand. Vomiting on arrival home. Marked dizziness lasted until

the third day. Bloody serum on the cotton in the meatus. Hearing test: whispering not heard at all in the right ear, conversational speech uncertain. Ear remains dry. Dizziness ceased in the third week when hearing test was: whispering speech not heard, conversation directly at ear. The last examination made in the tenth week, conversation speech heard at 3 cm. The result, therefore, of the operation was total deafness for voice tests in the days immediately following the operation, with a gradual improvement from third to tenth week, at which time, however, it was much less than before operation.

Bezold attributes the improvement to increase of pressure on the membrane closing the oval window: in this case, perhaps due to thickening and ossification of the cartilage existing there. He is confirmed in his opinion by having noticed that the artificial drum-head, made of absorbent cotton, improves the hearing only when pressed on the region of the stapes.

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Excision of the drumhead and ossicles; the present state of the question. Gomperz. (Vienna). Monatsschrift f. Ohrenheilk., etc., September, 1893.

Gomperz concludes: 1. The results as regard cure in otitis med. purulenta chronica are quite as favorable under conservative treatment as under operative.

2. Excision of the hammer and ambos should not be undertaken when less serious methods of treatment are competent to bring about healing.

After brief consideration of the mobilization, etc., of the stapes, the author discusses at great length the much-written-about extraction of that ossicle. References are made to the cases of Kessel,¹ Clark,² Berthold,³ Wolf,⁴ Ludewig,⁵ Jack,⁶ Schwartze,⁷ Bezold,⁸ Lemcke,⁹ and Stacke,¹⁰ with the greater number of which the readers of the ANNALS are familiar. As confirmation of Jack's statement in his second paper, that the best results were

¹ Kessel. Archiv. f. Ohrenheilk., XI, p. 199; XIII, p. 85.

² Clark. Zeitschrift f. Ohrenheilk., XXII, 41.

³ Berthold. Ibid, XIX, 1.

⁴ Wolf. Versamml. d. deutschen otolog. Gesellschaft Mai, 1893.

⁵ Ludewig. Archiv. f. Ohrenheilk., XXIX, p. 260.

⁶ Jack. Transaction Am. Otol. Society, July 19, 1892; Boston Medical and Surgical Journal, January 5, 1893.

⁷ Schwartze. Handbuch, II, 776.

⁸ Bezold. Versamml. d. deutschen otolog. Gesellschaft Mai, 1893.

⁹ Lemcke. Ibid.

¹⁰ Stacke. Ibid.

obtained in those cases in which the stapes was completely removed; he refers to two cases of his own in which the hearing ability was markedly increased (from 50 cm. to 7 meters. and from 70 cm. to 7 meters for conversational speech) by the formation, apparently, of an artificial temporary membrane of boric acid over the region of the fenestra ovalis.

His conclusions are that the results of this operation can not be predicted, and that it should be undertaken only when this fact is made clear to patients in whom the hearing cannot be improved, nor the subjective noises lessened in any other way.

A CASE OF HEMORRHAGE FROM THE EAR IN A BOY WITH IMPERFORATE DRUMHEADS.

STEIN. (Moscow), *Zeitschr. f. Ohrenheilk.*, XXIV, 4. After referring to the four previously reported cases of Ferreri,¹¹ Stepanow,¹² Eitelberg,¹³ and Gradenigo,¹⁴ the writer relates that of his patient.

Boy, aged 13, was suddenly seized with a profuse bilateral hemorrhage which lasted for three hours, soaking two handkerchiefs. For the past three years the boy had suffered from megrim, especially after severe exercise in gymnasium, more recently epistaxis. The hemorrhages from the ear lasted for four days, becoming gradually smaller in amount. The hearing and drumhead were always normal. The blood appeared to come from the openings of the duct of the ceruminous glands.

Stein arrives at the following conclusions:

1. Hemorrhages from the ear with intact meatus occur not only in women (hysterical), but also in men.
2. Hemorrhages, from the ear, vicarious in character, are observed after cessation of habitual bleeding, not only from sexual organs, but from nose as well.
3. The blood oozes from the excretory ducts of the ceruminous glands.

¹¹ Ferreri. Ref. *Archiv. f. Ohrenheilk.*, XIV, p. 173.

¹² Stepanow. *Mitth. f. Ohrenheilk.*, No. 11, 1885.

¹³ Eitelberg. *Internat. Klin. Rundschau*, No. 3 and 4.

¹⁴ Gradenigo. *Archiv. f. Ohrenheilk.*, XXVIII, p. 82, 1889.

ABSTRACTS FROM ENGLISH AND AMERICAN CURRENT OTOLOGICAL LITERATURE.

BY LEONARD A. DESSAR, M. D.
OF NEW YORK.

FIFTY MASTOID OPERATIONS.

Dr. B. Alexander Randall (*Medical Age*, Oct. 15, 1893), thinks that the four years' of epidemic influenza have greatly influenced the matter of mastoid inflammations, and enforced more frequent resort to operative intervention. Reports of such cases have multiplied during this period, and the author's operations, previously infrequent, rose to seven in 1889, ten in 1890, fifteen in 1891, and twenty in 1892. Yet the finding of past years, that about four per cent of his cases presented evidences of mastoid inflammation and about one-fourth of these demanded operation, has not been verified this year. On the ground of two hundred cases in which evidences of mastoid trouble existed, he believes that three-fourths of these cases can be brought safely through without resort to operation; and that unless the symptoms are urgent or the fluctuation unmistakable, the surgeon can give a fair trial to vigorous use of heat by douche and hot water bottles with rest in bed and good hygiene. When pus is present in or on the mastoid, however, there can be little cause for delay in evacuating it. In only one of his cases was death directly attributable to the operation.

QUININE IN DISEASES OF THE EAR.

Dr. W. Cheatham. (*Cincinnati Lancet-Clinic*, Dec. 16, 1893), states that quinine corrects tinnitus and vertigo when dependent upon debility and anæmia. It is also indicated in cases of Menier's symptoms, and in some cases of suppuration of the middle ear may be an absolute necessity, as is shown by the author's experience. He believes that in cases of quinine-deafness other factors entered, and doubts the possibility of quinine, administered in the usual doses, producing deafness, where is no other complication or an idiosyncrasy.

BENEFIT TO EAR PATIENTS FROM NASAL TREATMENT.

Dr. H. Gradle (*Jour. of the Amer. Med. Ass'n*), concludes that acute catarrh of the middle ear will generally terminate in

complete recovery under aural treatment, and sometimes even without it, provided there are no persistent nasal or pharyngeal lesions. When the latter are present, however, the disease is more likely to become chronic in spite of aural treatment, and cannot be cured or improved for any length of time unless the nose and throat are restored to a normal condition. Proliferating or adhesive disease of the middle ear is considered by the author as the consequence of retro-nasal catarrh. He regards aural treatment alone as practically useless in this form of trouble, while if nasal treatment is successful as regards the catarrh it will also cure the ear disease. The restitution of hearing, however, depends on the length of time the disease has lasted, and is often aided by ear treatment after the cure of the retro-nasal catarrh.

THE CLASS OF CASES IN WHICH WE MAY EXPECT GOOD
RESULTS FROM EXCISION OF THE MEMBRANA
TYMPANI AND OSSICLES.

Dr. S. M. Smith (*Therapeutic Gazette*, July 15, 1893), has obtained excellent results from operative treatment in 154 cases of middle ear disease. The procedures employed consisted chiefly in removal of the membrana tympani and ossicles. They were resorted to sixty-nine times in cases of non-suppurative disease of the middle ear for the relief of marked impairment of hearing, distressing tinnitus, or vertigo. In cases of suppurative disease the discharge was frequently arrested by the extraction of fragments of the membrana tympani and necrotic ossicles, and by establishing free drainage. The author lays stress upon the point that no operation in the entire range of surgery, if carefully performed, is attended with so little disturbance, either local or constitutional, as excision of the membrana tympani, malleus and incus, when not complicated with necrosis of the tympanum.

THE SURGICAL TREATMENT OF CHRONIC TYMPANIC VERTIGO
OFTEN MISCALLED MENIERE'S DISEASE.

Dr. Burnett, (*Medical News*, Sept. 30, 1893), says that tympanic vertigo, due to lesions of the middle ear is of frequent occurrence. It is often recognized by the general practitioner as aural vertigo. It is not unusual for tympanic vertigo to be attributed to intestinal disturbance, or to "neurasthenia" instead of to an aural lesion. True tympanic vertigo, due to a lesion in the middle ear, chiefly from chronic catarrh of the tympanic cavity, is paroxysmal in

character, and attended with tinnitus and deafness in the affected ear. It is caused by the inward pressure exerted in the labyrinthine fluid by the retracted and anchylosed ossicles. The foot plate is thus unduly pressed into the oval window, and there held by the force made, paroxysmally, and for a longer or shorter period.

The author regards morbid pressure due to an impacted stapes upon fluid in the labyrinth as a local cause of vertigo. In a case of chronic middle ear catarrh attended with constant tinnitus, repeated attacks of vertigo and deafness of two years duration, he obtained a favorable result by liberating the impacted stapes by removing the adherent malleus and the membrana tympani. His experience in subsequent cases, however, demonstrated that removal of the incus alone, or of the incus and stapes, the membrana tympani and malleus remaining in position, would liberate the stapes and the compressed labyrinthine fluid, as well as, or perhaps better, than total excision of the membrana and malleus, with less liability to inflammatory action.

On the ground of ten operations, inclusive of resection of the long process of the incus, Burnett concludes:

1. That removal of the retractive force of the sound conductors upon the stapes is the efficient means of relieving the tinnitus, deafness and vertigo due to the lesions of chronic catarrh of the middle ear.

2. That the removal of the retractive force upon the stapes can be accomplished efficiently and simply by removal of the incus alone, and even by resection of its long process.

3. That the improvement in these cases is due to the liberation of the stapes from the retractive power of the tensor tympani muscle and the consequent unimpeded action of the stapedius muscle, which, relieved from the antagonism of the tensor tympani, tends all the more to draw the stapes from the oval window, thus aiding in its isolation and improved mobility as well as removing the undue pressure inward upon the labyrinthine fluid.

4. It would seem wiser, therefore, in most cases of chronic catarrhal deafness, tinnitus and vertigo, not to sever the stapedius tendon and remove the stapes, but to be content with the removal of the incus only.

5. The progressive improvement in hearing noted in many instances must be due to the passive motion exerted upon the anchylosed stapes by sound waves which are enabled to reach this bone more freely after the removal of the incus.

RHINOLOGY AND LARYNGOLOGY.

ABSTRACTS FROM CURRENT LARYNGOLOGICAL
AND RHINOLOGICAL LITERATURE.

BY M. D. LEDERMAN, M. D..

OF NEW YORK.

THE NASAL REFLEX IN CHLOROFORM SYNCOPE.

M. Guérin, (*Glasgow Medical Journal*, Vol. 40, No. 4), remarked before the French Academy of Medicine, that inhalations of chloroform by the nose were much more dangerous than similar inhalations by the mouth. The irritation of the pituitary mucous membrane could produce a fatal syncope by reflex action. A tracheotomized rabbit was shown, "to whose throat there was applied an apparatus for registering the beats of the heart. As long as the chloroform was administered by way of the tracheal canula, the cardiac contractions went on unaltered; but when the anesthetic was inhaled by the nose, they became feeble, slow and irregular. Where the anesthesia was already deep, nasal respiration had much less effect than at the commencement." M. LeFort reported a case of a child which was being operated upon for syndactyly. The young one was breathing in the chloroform very slowly, and was told to breathe more rapidly. Instead of taking a deep breath, it made a long, forcible snuffle and immediately died. Artificial respiration, insufflation by mouth to mouth and tracheotomy were of no use, death having taken place by syncope.

RHINOLITHS.

Cozzolini (*Amer. Jour. of the Med. Sciences*, Vol. 107, No. 1), reported two cases. In one, the rhinolith had produced a partial destruction of the nasal septum, creating a perforation and appearing in the other chamber. This is supposed to be the only case of its kind on record, excepting the one found on the cadaver by Zuckerkandl. In the other case, two rhinoliths occupied the same fossa. The author differentiates between a true and false rhinolith. In the former the calcareous deposit becomes formed around a nucleus of mucus or of blood, while in the latter, which is the more common, a foreign body such as a cherry stone, a bead, or extraneous matter, forms the nucleus. The true rhinolith is rarely found before the fortieth year of life, and the false one at any time.

the foreign element usually being introduced early in life. For their removal, Cozzolini recommends the bent probes. They are to be introduced behind the body, so as to drag it forward. The forceps usually push it further into the nasal chamber.

TUBERCULOMA OF THE NASAL MUCOUS MEMBRANE.

PROF. DR. O. CHIARI, Wien, (*Archiv. fur Laryn. et Rhinol.*, Vol. 1, No. 2), in an interesting paper upon these rare manifestations of a tubercular diathesis, the author mentions other cases which have been recorded up to the present time. Together with the six cases he reports the total number of tubercular tumors carefully described as twenty-one. In eleven of these cases the bacilli was found. In six instances the diagnosis was made histologically, and in four, by the clinical aspect. The rarity of these growths is apparent, when we learn that only six tuberculoma were found by Schäffer in 450 cases of nasal tumors, and Prof. Chiari's six cases were discovered in a yearly practice of 1500 throat patients for over four years.

In nine instances the tumors were found in males, and twelve times in females. Three patients were respectively 7, 9 and 12 years of age, while one was 16 years old. Under 30 years, five cases were noticed, and the rest appeared in individuals beyond that period to 63 years. In thirteen cases no signs of tuberculosis were found in the lungs, but in seven individuals the disease was either hereditary, or the patients were scrofulous.

In eighteen instances the cartilaginous septum was the part infected, either by the sputum of the patient or by finger nails which carried the bacilli. In appearance the growths were nodular, of a red color, soft in consistency and covered with muco-pus or crust formation. Usually they were confluent, but occasionally they were observed isolated.

The patients complained of a continued discharge, with expulsion of scabs, epistaxis, and finally nasal occlusion. Pain was absent. The growths were removed by the galvano-cautery and cold snares, or with the sharp spoon. The latter method generally excited considerable hemorrhage, which at times could only be stopped by tampons.

Even with the possibility of a return of the disease, the author thinks the prognosis is fairly good. Out of the twenty-one cases mentioned, four became the victims of pulmonary tuberculosis. This local form of the disease does not seem to develop a general miliary tuberculosis.

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ANNALS

OF

OPHTHALMOLOGY AND OTOTOLOGY.

APRIL, 1894.

SOME CONSIDERATIONS UPON THE CURABILITY AND TREATMENT OF OPHTHALMIA NEONATORUM.¹

BY HIRAM WOODS, M. D.,
OF BALTIMORE, MD.

IN December, 1893, in my service at the Presbyterian Eye, Ear and Throat Charity Hospital, a baby came out of an attack of ophthalmia neonatorum with scarred corneæ. There will be useful but never perfect sight. In the summer of 1892 I saw a child at the Hospital, in the service of a colleague, with one cornea badly damaged. In both instances the medical attendants can, I think, be acquitted of blame. My case was doing well. On November 30, my assistant, Dr. C. W. Hartwig, found the corneæ clear. The child was not brought to the Hospital again until December 8, though the mother was warned to come daily, or send word if she could not come. The corneæ were hazy when she returned. After three or four days attendance, she again absented herself a week. The mother of the other child was directed to come to the Hospital Sunday morning. For some domestic reason she stayed away from Saturday to Tuesday. In both of these cases home cleaning was bad, and failure to come regularly to the Hospital was but part of general neglect. The child under my care was badly nourished. In the *Journal of the American Medical Association* for November 25, 1893, is a brief account of a case lost in the practice of Dr. B. Alexander Randall, of Philadelphia. While reading it, I recalled a baby I saw three or four years ago, with both corneæ destroyed. A personal and professional friend, who had charge of the case, gave me a full account of it. If his directions were carried out the child should

¹Read before the Clinical Society of Maryland, February 16, 1894.

have recovered. Dr. Randall gives his case in detail in *The Trans. Am. Oph. Soc.* for 1893. So far as I can see, no one could have done more than he did.

In the light of these cases, I have reviewed my own experience and observation with special reference to this: Is purulent conjunctivitis of the newly born always curable? Personally, the case mentioned is my only failure to preserve the cornea, if unaffected when coming under my care. Again, excepting the cases above, I have never seen a child blind from this disease, in whose case I could not find some radical fault in treatment: in the time when proper treatment was commenced, or in the method pursued. But such cases as Dr. Randall's, whatever one's own experience, compel a negative answer to the question asked. Fortunately such cases are exceptional. The large majority can be cured by proper treatment. A few cases, however, do not yield to cleanliness and the daily use of a one or two per cent silver solution, but yet are curable. What can cause the delay, and how should ordinary methods be modified?

A frequent cause, I am satisfied, is rough handling. The disease is usually met among the poor. Trained nurses cannot be employed. Yet, half-hourly cleanings are a necessity, and the home folks must attend to this part of the work. How can they, with least danger to the eye? In my opinion, it is wrong to allow them to use any hard instrument beneath the lids. Not unfrequently they are provided with absorbent cotton, a probe, match-stick or tooth-pick, with instructions to wrap the cotton on one end of the instrument and wipe the pus from inside the lids and off the eye. As a rule, this results in separating the lids, and passing the instrument blindly toward the eyeball. I have seen the conjunctiva bruised, and the corneal epithelium abraded by this tooth-pick traumatism. An effective and safer way, and one easily learned, is to separate the lids gently at the same time retracting and slightly everting them. Frequently repeated, such a procedure brings pus to the surface by the motion of the retracting and everting thumb or finger.

A persistent discharge, diminished little, if any, by cleanliness and the daily use, for a week, of a one or two per cent silver solution suggests to me this: Is the remedy being used properly? Should the silver be discontinued or used in stronger solutions, or in the form of the mitigated stick? I believe a case often turns upon the correct solution of this. If the silver be not indicated as an antiseptic and astringent, it should be stopped, for it may cause

incurable opacity by its caustic properties. If infection be too virulent to be overcome by a weak solution, or if, whatever the pathological explanation, faithful treatment has failed to benefit, and certain conditions persist which are known to call for the exhibition of silver, no greater mistake can be made than to discontinue it. In November, 1890, I presented a paper to the Maryland Medical and Chirurgical Faculty at its semi-annual meeting in Cambridge, Md., upon "some unusual effects of remedies in common use for eye troubles." The paper was subsequently consigned to oblivion in the short-lived and defunct "*Baltimore Medical Record*." I narrated some cases of ophthalmia neonatorum which failed to improve under silver, used for weeks, but which recovered as soon as the silver was stopped, and borax or alum and zinc substituted. Later experience has confirmed what I said then. Not only may silver fail to cure, but its persistent use may destroy the cornea. Last January I saw a well-nourished baby boy, 4 weeks old, with slight conjunctival purulency, soft lids, smooth palpebral membrane, ocular conjunctiva unaffected, both corneæ opaque. The father told me that mattering had begun on the fourth day. Under the direction of a physician, the eyes had been cleaned each half-hour, day and night, for one week. The medical attendant, who was called in as soon as purulency was noticed, applied a silver solution once daily with decided benefit. At the end of a week this physician left the city for a time, saying the eyes were clear. Some students at the dispensary where the child had been treated succeeded the physician. They, the father said, "had dropped the nitrate of silver solution daily on the eyeball" until the day before he came to the Presbyterian Hospital: *i. e.*, for sixteen or seventeen days. All this history, save the *act* of the students, including their visiting the case, I have since confirmed. The opacity is characteristic of cauterization, not of ulceration. No gonorrhœic history in either parent was obtainable, nor do I believe there was such a condition.

As nearly as I can give it, the clinical condition demanding the non-use or discontinuance of silver is: conjunctival purulency, unaccompanied by the swelling or tension of the lids, characteristic of infiltration, and without papillary swelling of the conjunctiva, or much of it, on the upper lid, and the deep red color seen in the conjunctiva in severe cases. This is the condition now and then seen in cases that come under the oculist's care for the first time, after five or six weeks of purulency, having clear corneæ, although there has been little or no treatment. Again, starting as

severe cases, routine cleanliness and the one per cent solution soon bring them to this condition. and then improvement ceases so long as the silver is continued. Discussing Dr. Randall's case at the Ophthalmological Society, Dr. J. A. Andrews, of New York, spoke of this matter as follows: "Three years ago * * * I found that the children transferred from the Maternity Hospital to the Ophthalmic wards of the Charity Hospital were losing their eyes, and I believe the reason was to be sought for in the treatment rather than in the disease. I had come to the conclusion that a considerable percentage of the cases of ophthalmia neonatorum were non-gonorrhœic. * * * The above was quite common in one ward, and I set to work to find out the cause." Examination of the vaginal discharge of the mother, the discharge from the baby's eyes, and plate cultures made from the air of the room gave no satisfactory explanation. Quoting farther: "I told the physicians I believed the nitrate of silver was spoiling the eyes. I had become convinced of this some years before. I am speaking of ophthalmia neonatorum not due to gonorrhœic infection. In such cases, the simple washing of the eye, the application of cold, and the flooding of the eye with vaseline cured every case, but where the silver was used there was always mischief done to the cornea. The eye was not necessarily lost by a single application of silver, but where this treatment was persisted in the eye was invariably lost. * * * Where there is little discharge and swelling of the conjunctiva, the silver should be used very sparingly or not at all." A more important lesson cannot be learned than this: there comes a time in the progress of a certain percentage of cases when, although there is still purulency, nitrate of silver will not cure: on the contrary, it perpetuates the discharge, and if persisted in clouds the cornea. Provided the silver is stopped, it makes little difference what unirritating remedy is used: the eyes get well. In a certain number of cases, purulency continues a long time, and causes anxiety; but in my experience, such cases get well eventually, provided the eyes are kept clean. If silver be used to stop pus formation, although the conjunctival condition does not demand it, nothing but harm results.

I speak of stronger silver solutions than two per cent. or of the mitigated stick with hesitation. Cases demanding such remedies are rare. That they occur at all is not universally admitted. The remedies are capable in unskillful hands of doing injury. Only one with trained judgment and a trained hand should advise or apply such agents. There is a connection etiologically and

symptomatically between gonorrhœic ophthalmia and many cases of purulent conjunctivitis of the newly born. But, usually, points of difference call for different methods of treatment. In gonorrhœic conjunctivitis of the adult one finds, as a rule, great lid swelling and infiltration, with inflammation and chemosis of the ocular conjunctiva. These symptoms are rarely so intense in ophthalmia neonatorum as to demand the special attention they require in the adult. This disassociation can, I fear, be carried too far. Certain things in an adult call for a certain remedial measure. Because it is not called for as a rule, in the infant, it may be omitted when it would do good. Such, I believe, is the case with strong solutions or the mitigated silver stick. Pus is the chief source of danger to the child's eye. It comes from the palpebral conjunctiva. A one or two per cent solution, applied once a day, with constant cleanliness, usually suffices to stop pus formation and save the eyes. But now and then such a case as this is seen—the first upon whom I used the mitigated stick:—a sickly, bottle-fed infant, profuse discharge, lids greatly swollen and congested, conjunctiva of lids rough and swollen. Two weeks of cleaning and a one per cent solution did no good. The corneæ became hazy. On the statement of Soelberg Wells that such cases, common enough in the adult, are occasionally seen in infants, and are benefitted by the mitigated stick, I applied it. Pus secretion ceased almost entirely. Cold applications were used. In twenty-four hours the eschar was thrown off, and pus appeared again. But the corneæ had had twenty-four hours rest, while the lids were softer. A second application was made in forty-eight hours, and from this recovery was uninterrupted, the corneæ clearing. This case occurred in my early practice. I believe now, as firmly as I did then, that the eyes would have been lost but for this step. A similar case has just been discharged cured. Boy was admitted January 26, three weeks old. Mattering eyes since third day. The eighteen days between the appearance of the disease and admission to the hospital were given to sugar of lead solution and rose water. Corneæ were clear. Half-hourly cleaning and the daily use of a one and then two per cent silver solution did not affect pus formation. On February 4, after ten days, Dr. Hartwig, noting the rougous conjunctiva and swollen lids, pencilled the membrane with a thirty grain solution, and followed it with cold and a weak copper and alum solution—grs. i and iii to \mathfrak{z} i. Pus formation ceased, returned in a lessened degree in forty-eight hours, and the case speedily recovered. Another case, now under care, was not benefitted by nine days treatment from February 2 to 11. Deeply congested, swollen, infiltrated lids, rough, hypertrophied palpebral membrane, profuse discharge were the con-

ditions observed on the 11th, when the conjunctiva of each upper lid was pencilled by Dr. Hartwig with the half-dram solution, and iced cloths applied. The alum and copper was substituted for a one to four-thousand corrosive solution, used every fourth hour. There was lessened purulency on the 12th with softer lids. More on the 13th when the pencilling was repeated. To-day (16th), purulency is very slight, the lids are not infiltrated, and the child is practically well. In two or three of the very few cases where I have thought this treatment necessary, I have noted a rather long duration of slight purulency, without return of conjunctival or lid swelling. I have not seen scar formation. Children, prematurely born, those brought up on artificial food, those with poor digestion constitute a dangerous class. (Knapp, Howe—*Am. Oph. Soc. Trans.*, 1893). Powers of resistance are low. With my experience in using strong solutions and the mitigated stick in obstinate cases, I should, if the condition of the lids and conjunctiva indicated it, use one of them earlier with such infants than with those healthy and nursing. In some of these cases I found gonorrhœic history in one or both parents. In the two recently treated no such history was obtainable. A bacteriologic examination of the conjunctival pus was not made. I am not disposed to think that such examination is of so great importance, as either a prognostic or therapeutic indication, as the condition of the lids and conjunctiva. Three years ago my friend, Dr. Robert L. Randolph, (personal communication), examined the pus of twenty-six cases at the Presbyterian Hospital. He found the gonococcus in twenty-four. Some of these babies were under my care, and in every instance, where the cornea was clear the day of admission, the eye was saved. I am not aware that any eyes were lost, and am confident I should be, were such the case. On the other hand, Dr. Andrews (loc. cit.) examined the secretion in eighty-eight cases and found the gonococcus in both mother and child in but two instances. He says: "The typical clinical picture of gonorrhœic conjunctivitis was absent in eighty-six cases; nevertheless, five eyes were lost among five of the infants, and one infant lost both eyes, the disease being in these six cases non-gonorrhœic." Dr. Andrews attributed the loss of these eyes to the abuse of silver.

To put all the foregoing into a single conclusion: Conjunctival purulency in a newly-born infant does not necessarily demand nitrate of silver. The appearance of the lids and conjunctiva decide its use as well as its continuance and strength.

Finally, I wish to protest against a practice which I believe is only too common: the instillation of cocaine in purulent conjunctivitis to allay pain. Such a practice seems to me deliberately inviting trouble.

816 Park Avenue,

TRAUMATIC PARESIS OF LEFT INFERIOR RECTUS COMBINED WITH TRAUMATIC INSUFFICIENCY OF LEFT EXTERNAL RECTUS.

BY CHARLES ZIMMERMANN, M. D.,
OF MILWAUKEE, WIS.

ON January 20, 1893, Lawrence Kennedy, a healthy sailor, aged 36, who never had any eye disease, received a blow on his left eye from a fist coming from his left. His lids swelled so that he could not open his eye, but he ascertained that when he pulled them open with his fingers he could see. January 30, he came to me with the following condition of his left eye: The lids were not swollen, but the bluish and yellowish discoloration of their skin indicated ecchymoses in the state of absorption. The palpebral fissure was as wide as on the right side. Under the temporal portion of the ocular conjunctiva was a considerable accumulation of blood in consequence of the blow which had struck this side of the eyeball. V., L. E. = $\frac{1}{2}$, V., R. E. = $\frac{1}{2}$, V. field, not defective. He complained of diplopia when looking straight and in the whole lower portion of the field of fixation. Especially in walking on the street he was greatly annoyed by seeing objects double. If he wished to avoid double vision in a straight forward direction he bent his head forward, turned it to the left and looked to the right and a little upwards.

These visual disturbances; as well as the subconjunctival extravasations pointed to an affection of ocular muscles, caused by a direct lesion, viz: partial laceration of their fibers, contusion or ecchymoses into the sheaths of the muscles, mechanically impeding their movements. As there was no manifest lack of mobility of the eyeball, the examination of double images had to be resorted to in order to arrive at an accurate diagnosis as to which muscles were paralyzed. The false image belongs to the left eye and has a vertical, a lateral, and a torsional displacement in and below the horizontal plane. In the upper field of fixation there is no diplopia.

VERTICAL DISPLACEMENT. The false image is lower and nearer than the true, increasing in distance downwards and in abduction (to the left). If the candle is placed one meter from the eye the false image is about 25 cm. lower than the true, when looking to the left and downwards. This distance decreases towards the right, so that finally the top of the false touches the bottom of the true image.

LATERAL DISPLACEMENT. The double images are homonymous (to the left). In looking to the left and downwards (abduction) it is 5 cm. to the left; in adduction it reaches the true one on the left side. If prism 12 is held before the right eye, base upwards, the false image rises, still remaining below the true, but its lateral distance increases to about 5 cm. in the horizontal plane (without prism 1 cm. when looking to the left, perpendicular below when looking straight forward). If the same examination is made in the upper field, in order to exclude the original diplopia, homonymous double images with lateral distance are observed.

TORSIONAL DISPLACEMENT. The false image diverges with its upper

end from the true image. Although this sloping is very rarely observed by patients, our patient noticed it himself without having his attention called to it.

Diagnosis. The displacement of the double images downwards indicates a paresis of superior oblique or inferior rectus. In this case it must be the inferior rectus, as the vertical distance increases in abduction, which constitutes the essential point of distinction. The sloping to the affected (left) side is also in conformity with a paresis of the rectus inferior, but the false image is homonymous, and the rule is that it should be crossed. (In paralysis of the superior oblique the double image is homonymous, but slopes towards the sound eye). The reason for this may be, first, a secondary contraction of the antagonist, *i. e.*, the superior rectus; second, inclination to convergence by previous position of equilibrium, for instance, insufficiency of external rectus. In the former case we would also expect diplopia in the direction of action of the antagonist (superior rectus), *i. e.*, in the upper field of fixation in which, however, our patient had monopia. In regard to the latter case, previous disturbance of equilibrium by insufficiency of the external rectus is very rare, and our patient had no ocular affection before. To be sure the prism test revealed an insufficiency of the external rectus (even in the upper part of the field of fixation), but it was brought about by the injury, the greatest amount of blood being located at the region of this muscle. Thus, the traumatic insufficiency of the external rectus explains the displacement of the double images in our case, as in looking downwards, the divergence caused by the paresis of the inferior rectus was changed into convergence. The insufficiency also accounts for the increasing lateral deviation in looking downwards. As long as there exists monopia, as in the upper field of fixation, the external rectus, although weakened by the trauma, will overcome the effort of contraction by fusion in the interest of binocular vision, but as soon as from the loss of function of the inferior rectus double vision sets in, it does not evolve any power for action, and pathological convergence occurs, converting the originally crossed into a homonymous double image. There was no other treatment required but massage, to favor the absorption of the extravasations of blood into the sheaths of the muscles which restricted their function, and a bandage.

A week later, on February 6, the condition had so far improved, that in looking to the left and downwards the false image was only 18 cm. lower, and only 3 cm. to the left. On February 14, the patient felt so much better that he resumed his occupation.

433 Milwaukee Street.

A CASE OF CYSTICERCUS OF THE VITREOUS.

BY W. CHEATHAM, A. B., M. D.,

OF LOUISVILLE, KY.

THIS affection being so rare in America, England, France, and countries other than Northern Germany, I feel justified in reporting a case that came under my observation.

Mrs. F., aged 42, of Irish parentage, consulted me May 22, 1893, concerning her left eye. January, 1893, she had some severe acute inflammation of her left eye in which there was intense pain and edema of the lids, which lasted for some weeks. She now has vision of left eye $\frac{15}{40}$ with no improvement by glasses. She has some scars of upper part of cornea simulating those found in trachoma, with slight pannus. I was surprised on everting the lid to find no indication of her ever having had trachoma. Vision, right eye $\frac{2}{200}$ and eccentric. She said her right eye had been blind—following a spell of sickness—since she was fifteen years old, or twenty-seven years. She did not come to consult me concerning her right eye, yet as a matter of routine, I examined it. I found all the media perfectly clear. Just at or over right macula I discovered a sac or cyst, pedunculated, the pedicle being attached to the retina above and external to the macula, the body of the sac extending down and in, over the region of the macula. The sac with its pedicle appeared a bluish gray, and opaque, except a part of the wall toward me about the size and shape of the optic nerve entrance, which was transparent and through which the deeper or other wall could be seen.

The eye was emmetropic with the ophthalmoscope. The highest or most prominent part of the sac, just at the transparent part referred to, could be seen best with a $+10$ D. showing an elevation of about 2.3 mm.: The other cyst wall could be seen through this transparent portion best with about a $+2$ D. showing an elevation of about .52 mm. The sac was ovoid in shape with the edges at some points serrated, and at one point, down and in there was quite a projection. Over this sac small blood vessels could be seen, one up and in, which could be traced to a larger retinal vessel close by. No motion could be discovered in this opaque cyst. Forming something of a crescent from the lower and outer part of this sac was a transparent, reddish cyst; at the upper part of this cyst could be seen two spots looking like air bubbles, which were no doubt the parasite's suckers. This cyst, when watched closely, could be seen to have a distinct rythmical motion; a spot of pigment beneath it would appear and disappear: the motion was perfect. Above the attachment of the pedicle of the cyst could be seen two white crescent-shaped spots, no doubt the points of entrance of the parasite. The retina between the cyst and optic nerve presented the appearance of a recent detachment. Several large vessels run from the nerve direct to the sac, some of them disappearing under, and reappearing

on the other side. There were many more large vessels taking this course than usual. This would probably indicate that the trouble is of long standing.

The vitreous seemed to be detached over the optic nerve entrance.

Mrs. F. gave a history of several serious attacks of what she called congestion of heart and lungs several years ago. For six or seven years, up to January, 1893, when her left eye was so badly inflamed, her health had been very good. She thinks she is going through her "change." Left eye usually inflamed some every four weeks.

This case, besides being the second so far as I know of reported in America, presents other points of interest. Could this parasite possibly have been the original cause of the loss of vision of right eye twenty-seven years ago? I think this possible and probable. The vitreous is clear and but little damaged; but a small part of the retina and choroid are damaged. The parasite, from the appearance of the parts, seems to have left its old bed, and is migrating. Mrs. F. does not remember of ever having had any pain in her right eye. Could the disease she has had in her left eye be sympathetic? Sympathetic affections have their exacerbations and their times of quiet, as we all know.

Foster, *Encyclopedic Medical Dictionary*, page 1237, says: "Cysticercus cellulosæ is the larval stage of *tenia solium*. It has a quadrangular head, a long cylindrical body, and an elliptical caudal vesicle, and is from ten to fifteen mm. in length."

Manthüer describes the animal as follows: "The worm is provided at its posterior end with a round cyst-like formation which acts as the receptaculum scoliosis, into which the animal can withdraw, presenting when in this position the appearance of a round, whitish body. A small hole marks the mouth of this small receptacle. When the animal protrudes its head and neck out of the receptacle its body appears to be sprinkled here and there with calcareous deposits, and presents sometimes a smooth and sometimes a wrinkled surface. The body decreases in size towards the neck, to which is attached the head, with its four flattened down, but angular projections. A round-shaped snout can be projected by the animal from the center of its head, and this latter is provided at its base with a double row of hook-like tenacles which are capable of retraction. Each of the angular projections of the head is, moreover, provided with a rounded sucking apparatus."

Schmidt-Rimpler, page 276, says: "The embryo enters the stomach of the suitable host, in the food or water, loses its covering through the action of the gastric juice, bores into the blood vessels with its hooks and begins to wander. Finally it becomes

settled and now begins the second stage of its development in which it is known as cysticercus. It is converted into a vesicle with fluid contents."

All authors agree that they travel by the blood current. Cysticercus may occur in any part of the eye or orbit. They have been seen in the orbit, lids, conjunctiva, iris, lens, vitreous, choroid and retina. They are found more often in the posterior part of the eyeball than in the anterior. They are quite common in Northern Germany where uncooked meats are eaten; less often in Southern Germany, France and Italy. There have been three cases reported in Austria. Brudenell Carter says none have been seen in England, but Soelberg Wells reports a case in his book, page 328. In Northern Germany, Graefe saw eighty cases in 80,000 patients, or one in 1,000, in the deeper tissues of the eye; three in the anterior chamber, five beneath the conjunctiva, and one in the orbit. Hirschberg in six months saw 2,100 new patients in five of which he saw cysticercus, or one in 420 cases of eye diseases.

Of the one other case seen in this county reported by Dr. Minor. Loring, on page 188, says: "From the ophthalmoscopic appearances there was reason to believe that it was a true case of cysticercus, although it was not absolutely proved to be so."

Yet, from Dr. Minor's description of the case, and the ophthalmoscopic appearances, page 193, (Loring), I do not think there can be any doubt of its having been a case of cysticercus cellulosæ. How long a cysticercus can remain in an eye is in doubt. Cases of two and four years standing are common. Von Graefe saw a case in 1856, which was twenty years afterward seen intact by Hirschberg. Others have reported cases of long standing with vision nearly perfect. My case, as I stated before, is possibly of twenty-seven years standing. Usually though in from fifteen to twenty months irido-cyclo-choroiditis follows, and sometimes panophthalmitis with total loss of the eye. Von Graefe and Hirschberg state that there is not much danger of sympathetic inflammation, although sympathetic irritation is often present. Jacobsen reports sympathetic amblyopia. Two cysts have been seen in one eye, but none reported of both eyes being involved. Patients with cysticercus do not have tape-worm. The presence of this parasite in the eye is so dangerous to the vitality and the usefulness of the organ, that its removal has been undertaken and with success, but not with very flattering after results, when it is located in the posterior part of the organ. When in the iris a section of this membrane can be removed that holds the parasite.

A DEAD CYSTICERCUS CELLULOSÆ SUBRETINALIS.

BY T. A. WOODRUFF, M. D.

OF CHICAGO.

THE cysticercus cellulosaë is seldom or never found in the eyes of Americans, and is uncommon now even among those people of Germany, for instance, who are much addicted to eating raw pork. As an evidence of this, very few of the recent text-books published in this country say anything about this parasite. The rarity of its occurrence even in von Graefe's day may be seen from the statistics published by him (*Archiv. f. Ophthalm.* Bd xii, p. 174). In a total of 80,000 patients he had seen only about eighty cases of ocular cysticercus, the majority of which were in the vitreous or beneath the retina, especially the latter. Its development takes place between the retina and choroid, and gives rise to detachment of the former. Later on it perforates the retina and the parasite passes into the vitreous. As long as the vitreous remains clear the vesicle can be seen and its diagnosis made by the movements of the neck which at times is pushed out and retracted. Later the diagnosis is rendered more difficult by the turbidity of the vitreous due to the parasite setting up an irido-cyclitis which may lead to destructive inflammation of the eye.

With the ophthalmoscope it seems to be somewhat dumb-bell-shaped, bluish white in appearance, with a bright orange margin, and a sharply defined outline. A very bright spot is seen at one point of the cyst which corresponds to the head of the parasite. Wave-like motions along the contour of the cyst should be looked for. Delicate veil-like opacities forming in the vitreous humor are almost characteristic of the presence of cysticercus. The history of such a case, from Dr. Casey A. Wood's practice, will be of interest owing to the unusual signs present.

F. G., German, aged 46, presented himself June 20, 1893, complaining that he could not see as well as he did four months previous. About the middle of May noticed a spot like a spider in front of left eye. With the exception of insomnia and nervousness his general health was good. No history of tapeworm, but has recently, however, had "rheumatism" probably of the true articular variety. His field of vision in the left eye is deficient in lower and outer segment. V., L. = $\frac{20}{40}$; V., R. = $\frac{20}{30}$. Tension

normal in both eyes. The patient has never had any pain in the eye, puffiness of the lid, or redness of the ocular conjunctiva. There are no enlarged scleral veins or episcleral vessels. The media are clear, and fundus is well seen with the ophthalmoscope, a bluish white, translucent motionless growth, rounding and smooth, with a single teat-like projection occupies the upper, outer, and anterior portion of the vitreous cavity of the left eye. The retinal vessels are not enlarged and can be seen coursing over the surface of the tumor.. A small central, but motionless body, can be seen within the retinal cyst wall. No portion of the tumor can be readily seen through the undilated pupil. There has been no change whatever in the signs and symptoms, and no increase in the size of the tumor since it was first seen six months ago.

The diagnosis in this case has been rather difficult, owing to the absence of the in-and-out movements of the neck, the bright spot which corresponds to the head, and the wave-like motions usually seen in subretinal cysticercus. This can be explained in only one way: the parasite is dead, and the cyst contents have not increased.

A dead and encysted cysticercus is amongst the rarest things reported in ophthalmology.

A FURTHER COMMUNICATION ON THE RESULTS OF
A BACTERIOLOGICAL EXAMINATION OF THE
PIPETTES AND COLLYRIA TAKEN FROM A
TREATMENT CASE USED IN OPHTHALMIC
PRACTICE. WITH THE EFFECTS
OF INOCULATIONS.¹

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AND

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AT the meeting of the College of Physicians, of Philadelphia, April 3, 1893, we presented a preliminary communication² upon the subject contained in the title, and came to the results which were summarized in the following tables, and which are here reproduced:

The examination had not gone sufficiently far at that time to plate the cultures and separate the organisms which were present in the lotions and pipettes. The termination of this research is as follows:

The cultures yielded by the cocaine pipette and cocaine solution were found to contain the *micrococcus aquatilis*, the *bacillus liquefaciens* and the *proteus vulgaris*. In addition, the bacillus of Vignal was detected, which must have been an accidental and unusual contamination.

The boric acid solution contained the same germs as those found in cocaine, with the exception of the bacillus of Vignal.

The atropine lotion, which, when first examined, showed no growth but afterwards a fungus, contained two months after the first examination the *micrococcus prodigiosus* and the *bacillus liquefaciens*.

¹ Read before the College of Physicians, of Philadelphia, March 7, 1894.

² Trans. of the College of Physicians, 3d series, Vol. xv., p. 110; also Therap. Gazette, Sept. 15, 1893. The literature of the subject and previous work in this line of research are reviewed in this communication. *

PIPETTES.

Unused pipette.	No growth.	Same germs as those found in cocaine solution; inoculation caused purulent irido-choroiditis.	Rubbing abraded cornea with culture produced moderate ciliary injection, and slight clouding of cornea.
Cocaine pipette.	Growth on potato, agar, and beef-broth.		
Fluorescine pipette.	Growth on potato.		
Atropine pipette.	No growth.		
Pyoktanin pipette.	No growth.		
Homatropine pipette.	No growth.	Inoculation caused slight iritis.	Rubbing abraded cornea with culture produced moderate ciliary injection, and slight clouding of cornea.
Eserine pipette.	Growth on all three culture media.	Pipette had been frequently cleansed with sublimate lotion.	
Boric acid pipette.	No growth.	Slight iritis caused by inoculation, which speedily disappeared.	
		This pipette had often been cleansed with sublimate after use.	

FLUIDS.

Boric acid lotion.	Active growth on all three culture media.	Inoculation into anterior chamber produced purulent irido-choroiditis.	Rubbing abraded cornea with culture produced moderate ciliary injection, and slight clouding of cornea.
Atropine lotion.	No growth at first; one month later active growth.	The growth—a fungus—was not used in inoculation, as it was of same nature as that obtained from the fluorescine dropper.	Rubbing abraded cornea with culture produced moderate ciliary injection, and slight clouding of cornea.
Homatropine lotion.	Growth on all three culture media.	Inoculation produced slight iritis, which disappeared in fifteen days.	
Cocaine lotion.	No growth at first; two months later active growth on all three culture media.	Inoculation produced purulent irido-choroiditis.	
Fluorescine lotion.	Fungus growth on agar.	Not used in inoculation; growth same as from dropper.	
Bichloride lotion.	No growth.		
Nitrate of silver lotion.	No growth.		
Eserine lotion.	No growth.		

The homatropine lotion contained the bacillus liquefaciens and a fungus.

At the first examination the eserine pipette produced a growth on three different culture media, but the solution of the drug appeared sterile. Two months later the same solution, although tightly corked, showed a marked fungus growth (*aspergillus glaucus*). The bacillus liquefaciens and bacillus implexus were also present.

Inoculation into the eyes of rabbits with the individual cultures were made in the same way as in our previous experiments, namely, one-tenth of a cubic centimeter of an emulsion of the surface growth upon agar in the water of condensation, was injected, with all proper precautions, into the anterior chamber by means of a syringe. The daily appearances of the rabbits' eyes were exactly the same as those detailed in the first research, and need not be repeated.

The injurious effects of the inoculations from the cocaine and boric acid solutions, which were the same in both cases, were due to the bacillus proteus vulgaris. The bacillus liquefaciens produced an iritis, or more properly, a hyperemia of the iris, which disappeared in a week.

The micrococcus prodigiosus from the atropine solution produced the same effect, namely, purulent iritis, while the bacillus liquefaciens caused a moderate iritis, or hyperemia.

An inoculation of the culture of the bacillus implexus obtained from the eserine solution caused a purulent inflammation, while the bacillus liquefaciens obtained from the same source provoked only a moderate hyperæmia of the iris.

As has several times been shown by observers, and as one of us (E. A. de S.) has confirmed, an eserine solution, which contains the fungus growth, no longer responds to the tests characteristic of eserine. Francke has found that solutions of atropine and eserine, sterile at first, after standing for some time become contaminated, even if the bottles have been carefully corked. The germs appear to get in at the sides of the stoppers. This, it will be remembered, was the result in our experiments.

It becomes evident, then, that the following organisms are liable, sooner or later, to infest solutions of the alkaloids used in ophthalmic practice, namely: the micrococcus aquatilis, the bacillus liquefaciens, the proteus vulgaris, the micrococcus prodigiosus, the bacillus implexus, perhaps the bacillus of Vignal, and various fungi, particularly the aspergillus glaucus. Of these organisms the pro-

teus vulgaris, the micrococcus prodigiosus and the bacillus implexus introduced into the anterior chamber are capable of producing a purulent inflammation of the iris, cornea deeper coats of the eye. Exactly similar inoculations with the bacillus liquefaciens resulted in a hyperemia of the iris, possibly a slight iritis, which disappeared in a week; with the micrococcus aquatilis the effect was negative.

The growth of fungus in these solutions appears to have little deleterious effect upon the eye, but, as already noted, has the power, with eserine, at least, of changing its chemical composition.

As shown in the first research, these organisms, when inoculated upon an abraded cornea, the anterior chamber not being open, produced a moderate amount of ciliary injection and clouding of the corneal structure, but did not in our experiments call into existence a purulent inflammation of the eye.

It is unnecessary to repeat the methods of properly sterilizing alkaloidal solutions. These were summarized in the first paper, and have been published many times previously. Perhaps the most convenient and ingenious device for this purpose is the one introduced by Dr. Stroschein, of Wurzburg.³

³The experiments were performed in the laboratory of Dr. E. A. de-Schweinitz, and the preparation of the cultures and separation of the micro-organisms are entirely his work. We are indebted to Dr. William M. Gray for preparing the slides of the rabbit's eyes, which showed the lesions of an extensive purulent irido-choroiditis, both in the present and previous research.

TWO INTERESTING CASES OF CONGENITAL
DEFECTS OF THE EYES: ONE OF DOUBLE
CATARACT: ONE OF LARGE COLOBOMA
OF IRIS. CILIARY BODY. CHOROID,
AND OPTIC NERVE SHEATH.

BY EDWARD SWASEY, M. D.,
OF WORCESTER, MASS.

DOUBLE CONGENITAL CATARACT.

Mr. L., aged 23, operative in a thread factory, consulted me in January, 1894, to have his eyes examined for glasses to ascertain if these would improve his vision. He had been conscious of imperfect sight all his life, and has tried various glasses as found in the optician's stock, but had never had his eyes examined. His work was such that his vision served him fairly well. The eyes appeared at first quite normal, but on closer inspection both pupils gave a smoky appearance. Vision in each = $\frac{20}{200}$; improved to $\frac{20}{70}$ by a sph. — 1. D. lens. After some time he felt sure he saw quite as well without any glass. Javal showed 3. at 90° or 180° in each eye, but the proper cylinders of minus or plus gave no real improvement. The ophthalmoscope showed at the central posterior pole of each lens a perfectly round black spot. From the border of the pupil in the normal state could be seen fine needle-like opacities, quite resembling the finest ice crystallization passing backwards, and all seeming to converge to the black spot at the posterior pole. With the pupils widely dilated by atropine, this opacity was seen to be central, perfectly circular, and the convergence of the fine, straight opacities more clearly seen. The patient was sure he saw better with the pupils well dilated. The fundus was but indistinctly seen, but no abnormal condition was detected; no remnant of the hyaloid artery was seen.

The condition was perfectly symmetrical in every detail. There was no nystagmus. Whether this case presents any peculiar conditions in the form of its lens opacity, being so perfectly conical, and its point where the hyaloid artery reaches the lens and giving the appearance of a truncated cone, I know not, but I do not find just such a condition spoken of frequently. There was no family history of eye troubles. The remedy proposed was a double iridectomy downwards and upwards as being the most useful in all kinds of eye work.

COLOBOMA OF IRIS, CILIARY BODY, CHOROID, AND OPTIC
NERVE SHEATH.

Miss P., aged 19, typewriter, consulted me in January, 1894, to see if glasses could be fitted for her eyes to relieve a good deal of eyeache and headache which she had more or less constantly. Her vision R. E. = $\frac{20}{15}$; no Hm., L. E. = discern a moving hand before her eye, facing a bright

window. Javal gave .50 at 90° in the right, and same in the left. The ophthalmoscope showed R. E. emmetropic, fundus normal, save only for a small black spot the size of a pin-head half way down the retinal field under the optic disc, and the surrounding pigmentation for a small area at the same spot was slightly lessened. The iris was perfect.

In the left eye there was central downward coloboma of the iris, and a fine line of pigment tissue across the lower angle. The opposing edges of the coloboma were of a somewhat dirty yellow color as compared with the body of the iris, and the iris was less in circumference than its fellow, the color the same.

There was slight divergent strabismus in this eye. No reaction of pupil to a strong light, except in the lower field, and then it was hardly perceptible. It did not react in response to the right pupil contraction. The eye was same size as the right, tension normal. The ophthalmoscope showed media clear, refraction slightly myopic. There was no well defined optic disc, but a deeply cupped, paper-white depression, and from its overhanging upper edge the retinal vessels came climbing out at a sharp angle, as in glaucomatous cupping. A band of exposed scleral tissue extends upwards from these vessels for a short distance, then the normal fundus tissues become sharply outlined, the edge covered with pigment. There is also the appearance of an overhanging arch where the vessels come out, and this extends downward to the right and left, and seems to merge into the retina and choroid. The coloboma expands to the right and left as its edges pass downwards, and it reaches its greatest expansion at 45° downwards from the disc. At this point there is more pigmentation on the edges at the temporal and nasal sides, and small, separate flakes of pigment encroach upon the white field here, and also onto the red grained work. From this point the edges begin to converge, and so continue, when they are lost from the field of vision. Pigmentation extends along the entire border of the coloboma. A few vessels are seen in the white field on the temporal and media side especially. The color of the coloboma is pearl-white, while the disc is more of a dazzling paper-white color. I do not accurately measure the depth of the depression below the normal fundus, because of the dazzling whiteness. I do not find the vessels sharply curved at the edge of the coloboma as in the cupping at the disc. The bright light reflected from my ophthalmoscope mirror was not seen until it had reached a point 45° from above downwards and then but faintly, and increased gradually until in the lower field the moving hand could be seen as a light object. The hand could be discerned in the nasal and temporal field, much better in the latter. The macula region is not marked by any appearance other than is seen in the remaining retinal expansion. The patient's mother says the fissure was seen in the iris soon after birth, and that the infant was disposed to keep this eye closed more than the other, and would cry if this eye was opened. The patient has always experienced pain in this eye in a bright light, and at times she is compelled to close the lids completely. The patient has no other deformity, and is a bright, well-formed young lady.

Judging from the examinations made of a number of these cases of coloboma, I presume there is no true retinal tissue in this white expansion, but that it is more of a connective tissue formation.

Manz once stated his conclusions thus: "The rule is that within the coloboma the retina is completely wanting." Yet, later microscopic studies have shown that retinal elements are found in the coloboma, although in a much modified form. (Haas, Manz, Arlt). The blood vessels in this case do not show any very marked difference in the elevation of the white and red surfaces in the fundus which would indicate that some form of tissue exists in place of the true retinal. If this be so, we can hardly say that there is a true coloboma of the retina.

Much interesting literature exists regarding these fissures at the lower segments of the coats of the globe, as to variety, location, etiology, etc., but in recording this case of very large and unilateral coloboma, there is no occasion to attempt any review of this literature.

The interesting feature of this case is the peculiar coloboma, of which Dr. Swasey furnished a beautiful picture in colors, but our artist failed to get a satisfactory photograph of it and we could not wait for another effort to be made without causing a delay of the issue. We regret the failure, as the omission of the illustration impairs the value of the paper.

J. P. P.

THE SHIELD DRESSING FOR CATARACT EXTRACTION.

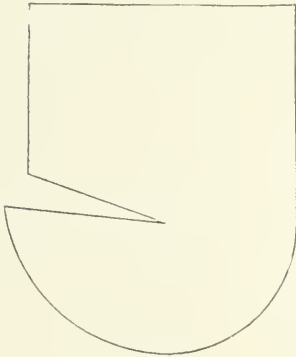
BY H. GIFFORD, M. D.
OF OMAHA, NEB.

SINCE my first paper on the shield dressing, (*Arch. of Ophth.* XIX, p. 505), a number of devices on the same principle have been described, nearly all of them, I am free to admit, improvements on the form originally proposed by me. The mask of Frothingham, (*Journ. Am. Med. Ass'n*, Aug. 29, 1891), is certainly as safe a dressing as can well be devised; and for the fortunately rare cases where the patient purposely tries to take off his dressing, it is superior to anything that I know. Its elaborateness, however, will tend to prevent its ready adoption. The same applies, to some extent, to the devices of Prout, McCoy, Andrews, and Ring.¹ Not that they are unreasonably complex nor difficult to have made, but when the profession is tolerably well satisfied with what it has, it is very difficult to get it to adopt anything new, which involves extra trouble or expense, even when the new thing can be plainly shown to be of advantage. For this reason, the simplicity of the modification of my original shield which I have been using for several years, may lead some to employ it who, otherwise, might never use any form of shield or mask dressing. It is simply a bit of ordinary, moderately stiff pasteboard $3\frac{1}{4} \times 4$ inches, cut in the shape of Fig. 1. This, when bent for the right eye and fastened with a stitch, has the outline of Fig. 2.

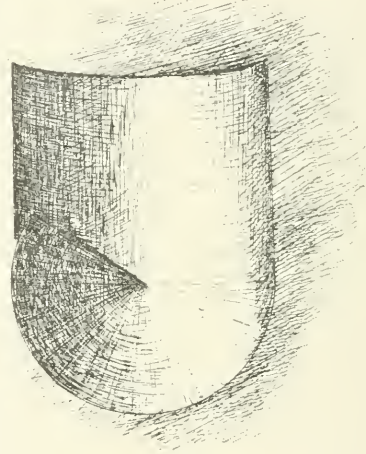
In applying the shield, the edge coming against the nose and cheek is moistened and curved back, and the shield is held firmly in place by a long roller bandage, the first three turns being passed

¹Since writing the above I have seen a note by Landolt, (*Archives d'Ophthal.*, 1892, p. 656), in which it is stated that the wire mask referred to by Fuchs, in his text-book, (Am. ed., p. 676), was invented in 1883, and was mentioned in the Cincinnati *Lancet* in 1888, p. 518, but on looking the matter up, I can find no trace of a Cincinnati *Lancet* in 1888; while in the Cincinnati *Lancet-Clinic*, in the number referred to, there is no mention of Fuchs' mask; so that while I have no doubt that this mask was in use before my shield, I cannot ascertain whether or not any notice of the former was published previous to my first paper on the subject.

directly around the forehead. It is well to put plenty of cotton under the shield over the forehead and along the side of the nose. The method used to close the eye under the shield can be varied to suit any preference. I use a moist dressing because patients generally prefer it, and because it is the least likely to cause any retention of discharges. A small loose pad of absorbent cotton, wet in boric acid solution, is allowed to settle, by its own weight, on the outer surface of the closed lids; over this, a bit of gutta percha tissue, coming well beyond the edges of the cotton, is applied; over this, enough cotton to cause, when the shield is firmly applied, a barely perceptible pressure on the lids, then the shield and the bandage. When it is desired to leave the lids free from all pressure, except that of a strip of plaster, it is best to pro-



(FIG. 1.)



(FIG. 2)

tect the inner and lower edges of the shield by fastening a strip of absorbent cotton along them with collodion. I use the shield in this form whenever I desire to protect an eye and still leave the lids perfectly free. I formerly used the strip of plaster dressing under the shield, but have abandoned it because it is apt to get loose and smeary, and where we have no guarantee of the asepticity of the plaster, it is objectionable on other grounds. Moreover, while the natural pressure of the lids is, other things being equal, the best splint for a wounded eye, I have gained the impression that it is easier for the patient to keep the lids and eyeball still if they have a slight support from the outside. This is quite a different thing from the effect of the ordinary pressure bandage :

the latter is liable to interfere with the coaptation of the wound lips, while, when the shield is used, it is impossible to apply the bandage so tightly as to cause undue pressure on the eye unless an unreasonable amount of cotton be put under the shield.

The advantages of some form of shield-dressing are so obvious as hardly to need mentioning. It allows a perfectly firm bandage to be applied without the slightest danger of undue pressure on the eyeball, insuring, at the same time, practically perfect security against external violence. Let me urge any who have never used it to try it in some case where much vitreous has been lost, and see if the sense of security which it gives does not induce them to use it in all cases where there is a large penetrating wound of the eye which needs protection, but which might have the coaptation of its lips interfered with by the pressure of the ordinary bandage.

1404 Farnam Street.

A UNIQUE CASE.

BY M. G. PARSONS, M. D.,

OF LARAMIE, WYO.

MR. N., aged 36, a laborer, came to me December 22, 1893, with iritis complicated with phlyctenular keratitis, one large pustule at center of pupil of right eye which soon broke down into an ulcer. He had been troubled at different times with sore eyes for the past six years, which came on while working in the mines, as he thinks, from sudden change from darkness to bright light when there was snow on the ground. The well eye was found to be myopic, the best correction with a sph. —3.25 D. only gave him $\frac{1}{5}$ vision; no astigmatism. The case was very obstinate, the ciliary muscle yielded to mydriatics very reluctantly—pain in the eye very severe, which assumed a neuralgic form of the right side of the head. This was periodical, coming mostly at night. Antiperiodics were resorted to, and pushed which only succeeded in changing the pain from night to day—bowels were constipated—cathartics were used, but no action from the bowels could be had without them. The patient became emaciated, in fact he seemed to be failing at every point, and his patience and courage was rapidly sinking. He was ready to consent to anything which offered in any way relief. He had been troubled with piles to some extent, and the unusual constipation then existing warranted me in making the attempt to relieve him of this troublesome condition. Upon examination the anus was found to be tightly contracted. Without an anesthetic, the sphincter ani was thoroughly stretched, nearly to the point of non-resistance.

Not having the proper instruments with me to determine whether there was stricture of the urethra, was compelled to be satisfied by finding a narrowed meatus, so a succession of sounds was used up to a 22 American scale, which was as large as the meatus would receive. Almost immediately the experiment was crowned with success. His torturing headache, cyclone-like, lulled, and an equilibrium was produced. My patient slept well that night, and the next day had three good free operations of the bowels without medicine. The almost hopeless eye which had been treated after

the usual manner in such cases, began to show the white sclera beneath the fiery red, which had resisted all efforts heretofore, the ulcer stopped its ravages, and my patient glided on to a sure and speedy recovery. Was it the long continued eye strain from uncorrected myopia that had produced this condition which had overpowered the nervous system, or was it, as our "official?" brothers would tell us, that the trouble was originally of the sensor and motor character, which they tell us are more readily aroused and put to rights by these operations. If so, thanks to the specialist at the other end.

A CASE OF ASTIGMATISM WHERE THE CONTOUR OF THE CORNEÆ INDICATED THE AXES.

By S. MITCHELL, M. D.,
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OCULIST AND AURIST TO ST. JAMES MERCY HOSPITAL. CONSULTING SURGEON
TO THE HORNELL SANITARIUM.

IN these times when the ophthalmologist can equip himself with an endless array of appliances for detecting and measuring astigmatism, (one or two of which are of value, and the rest worthless), no one would hardly think of making a diagnosis of astigmatism in a given case, by means of a simple inspection of the corneæ, unaided by any instrument, yet I was able to do this recently in a patient of mine.

The case was an old gentleman, 63 years of age, a farmer by occupation. He did not complain of his poor vision, but yielding to the urgent entreaties of his son, he had finally consented to consult an "eye doctor," after having tried to obtain glasses from several different spectacle peddlers.

His vision was $\frac{20}{200}$ with either eye, and J. 3 was read fluently. Upon looking at his corneæ, I discovered that their contour did not appear perfectly round, but they were both elongated nearly in their vertical meridian; in fact, they were both shaped similar to an egg with the smaller end pointing upward and slightly inward towards the nose, so that the right inclined at an angle of about 75° , and the left at 105° .

The measurements with the ophthalmometer were O. D. 10. D. axis 165° . O. S. 9. D. axis 30° .

By retinoscopy, (using the concave mirror), the shadow in the right eye moved across the cornea *with* the mirror at an angle of 165° while in the meridian at right angles to this, there was no movement of the shadow.

Different minus lenses brought before the eye by means of retinoscopy disk, did not reverse the movement of the shadow until — 10. D. was reached, In the left the movement of the shadow was also with the mirror at an angle of 20° only, and required a — 9. D. lens to reverse it.

It is almost needless to remark that spherical lenses did not improve the vision; but with — 9. D. cyl. axis 75° over the right eye and — 8. D. cyl. axis 105° over the left, vision was $\frac{20}{40}$ with either eye, and J. 3 could be read quite easily.

The above glasses were prescribed, and he has worn them with great comfort ever since. It is a common experience with all who use the ophthalmometer to meet with cases where the first glance at the patient's corneæ, when the eye is in position for examination, reveals, as in an imperfect mirror, a distorted image of the white band and black figures that compose the border of the disk of the instrument, and a diagnosis of astigmatism is made before we have looked through the telescope or moved the ocular, and we only need to proceed with the examination in order to ascertain the axis and amount of the error.

Such cases are so plain that he, who is so fortunate as to possess an ophthalmometer, may read off the error of refraction from the patient's corneæ as easily as he would from the pages of a book. But it isn't every day that we meet with a case where the guilty corneæ point out their own shortcomings, with such unerring precision that "all who run may read," and "the way-faring man, though a spectacle vender, with "Dr." tacked on the front end of his name, need not have erred therein."

Having spoken of the ophthalmometer, I would like to claim the privilege that so many have availed themselves of during the past few years, and say a word in regard to this unique instrument. Two years ago I made a pilgrimage to the metropolis for no other purpose than to learn of this instrument, and that from the lips of its champion. His voice was even more eloquent than his writings, consequently when I returned to my native heath, "Ophthalmometre. Javal and Schiötz. No. 304. (Modele de 1889)." found a welcome and permanent abiding place in a large bay-window in my office, constructed especially for it and where, by means of natural light only, it has been in use ever since.

My expectations of its helpfulness has, in these short two years, been more than realized. I did not expect it to do all of my refraction work while I sat idly by and turned the crank, and the employment of a mydriatic, in such cases, to be a thing unthought of. I still employ atropine or homatropine in refraction work whenever their use is indicated.

The fact that it does over-estimate in low degrees of astigmatism, and under-estimate in high degrees, or that it does not record at all .75 D. or 1. D. of astigmatism that may exist *against* the

rule, I do not consider adequate reasons for relegating this truly scientific instrument to the lumber-room. All should be aware, by this time, of these short-comings of the instrument, and to be fore-warned is with the physician to be fore-armed. If the gun of the marksman habitually carries to the right or left, due allowance is made for these slight discrepancies until a more accurate weapon can be procured, and the bull's-eye is punctured just the same.

Perhaps I have more patience with the instrument than some, because retinoscopy is as great a favorite with me as ever. (in fact, it occupies a position, in my estimation, superior to the ophthalmometer), and errors that the instrument fails to notice, are, by this simple method, revealed. And that too, in all their true significance when practiced by the aid of a mydriatic.

THE CONSERVATIVE TREATMENT OF MUSCULAR INSUFFICIENCIES.

BY F. C. HEATH, A. M., M. D.,
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TO those desiring to avoid either extreme—the radicalism of Stevens or the ultra-conservatism of Roosa—on this vexed question, a few reasons for what we may call moderately conservative treatment may not seem amiss.

I. The eye muscles are variable in their strength from day to day.

This depends largely upon the general condition and habits, insufficient or excessive exercise, lack of sleep, sexual excesses, use or non-use of glasses, etc. One of my cases showed, January 9, one degree of esophoria and the same amount of left hyperphoria; a month later there was complete orthophoria. Another had, December 14, two degrees of exophoria; February 11, equilibrium; March 18, one-half a degree of esophoria.

Snipping the muscles in such cases might produce or increase the very troubles said to be due to muscular insufficiencies.

II. Our diagnosis may be wrong.

A coincidence may be mistaken for cause and effect, symptoms due to some other cause being attributed to the insufficiency discovered. To illustrate: A physician came to me in January, 1893, complaining of vertigo or dizziness, peculiar feeling in the head, difficulty in concentration of mind, etc.—the very picture of muscular insufficiency as given by Seguin, Hotz and others. Examination revealed one degree of left hyperphoria, which was corrected by one-half degree prism, base down, for the right eye, and the same reversed for the left, combined with the spherocylinders previously prescribed for his refractive error. After one month's use there was equilibrium of the muscles, but no relief of symptoms. Impacted cerumen and otitis externa of right ear were next treated as the possible source of the symptoms, but dizziness persisted after complete recovery from these conditions.

A functional heart affection was determined upon later, (partly by exclusion), as the possible cause of all the trouble. How serious an error tenotomy of the ocular muscles would have been in this case!

III. Somewhat akin to the preceding is the difficulty in deciding which is the cause and which the effect in some cases of nervous prostration with insufficiency of one or more eye muscles—there is reason to believe that the insufficiency is quite as often the effect as the cause of the neurosthenia.

II. Moreover, some patients are neurotic by birth, as Roosa says, and never can be cured. Palliation is all they can ever expect. When we recognize cases as almost certainly of this class, radical treatment becomes hardly justifiable.

I. We should first thoroughly understand the effect of refractive errors and their correction.

As errors of refraction frequently cause muscular insufficiencies, correction of the former will often relieve symptoms due to the latter. Many cases like the following illustrate this:

Mr. D., a sufferer from headache, was found to have astigmatism and exophoria, corrected astigmatism only. After two months reports entire relief. The presumption in such cases is that the insufficiencies disappear after removal of the cause, but this cannot be proven owing to the impossibility of getting an examination at the time relief was reported.

Some cases show that symptoms usually attributed to insufficiencies are really due to the refractive errors, glasses correcting the astigmatism, and hypermetropia causing symptoms to disappear while the muscular insufficiency is unchanged.

To illustrate: Miss H. complained of dizziness, and neuralgia in eyes, temples and back of head. Found and corrected astigmatism as follows: R. E., $+1.50$ D. cyl. ax. 100; L. E., $+1.50$ D. cyl. ax. 80. One-half degree of hyperphoria, and two degrees of exophoria for distance, eight for near point, were found but not corrected. Four months later the dizziness and neuralgia had disappeared, but the insufficiency remained the same.

IV. Regulating the effect of an operation is difficult, if not impossible.

This may be too much, too little, or none at all. Roosa speaks of patients with diplopia produced by tenotomy. In the only one of Ranney's cases fully recorded, the muscles, some weeks after the operation, show the same strength as before.

V. Results reported by operators are often due to other things than the operation.

The glasses prescribed in most of these cases may deserve credit for much of the benefit reported. In other cases it may be merely *suggestion*, as Davis shows of one of Ranney's cases, probably a case of hysteria.

VIII. Some cases show weakness of *all* the muscles.

Obviously, operation is then not to be thought of.

IX. Simple measures relieve many cases.

The results of correcting refractive errors have already been referred to. A ten days' hunting trip benefitted one of my cases very much. Prisms often give satisfaction. Two cases will suffice to illustrate this:

Case I. Mr. T. Reading and theater going cause bad feeling in eyes and head. Subject to "bilious headache." No manifest error of refraction, but two degrees of exophoria for distance and five for near point. Two degree prisms, base in, for reading gave entire relief.

Case II. Miss P. Pain in head, especially back of head and neck. Found astigmatism and five degrees esophoria; ordered for each eye $+1.50$ D. cyl. axis 90° with prism two degrees, base out. They have given perfect satisfaction for over a year.

Some cases are relieved by exercising the muscles regularly. Savage's method has not proven so satisfactory in my hands as some others. Gould's plan, given in the *ANNALS* for January, 1894, promises well. My best results, so far, have been with Dyer's method. One case shows the efficiency of this so well that it deserves a place here:

Mrs. M. Troubled with frequent dizziness, drawing feeling in eyes, etc. Had one spell of "falling unconscious." Had exophoria and slight astigmatism. One oculist had performed four tenotomies (probably graduated), on her externi without improvement. Small doses of strychnia, with prism practice two or three times a week for two months, and weak cylinders correcting the astigmatism, effected a practical cure, the insufficiency almost entirely disappearing, and no disagreeable symptoms remaining except occasional spots before the eyes.

In this plea for conservatism, I hope to be not misunderstood as claiming that operative treatment in muscular insufficiencies is never advisable, but that it should be resorted to only in persistent cases, not hopelessly neurotic, with diagnosis reasonably certain, with due regard to above considerations, and after the more conservative measures have been tried and found wanting.

A CASE OF OTITIC BRAIN ABSCESS. OPERATION.
RECOVERY.

BY CHARLES HENRY BURNETT, M. D.

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MARTHA CREECH, aged 16, a weaver, was brought by her mother November 23, 1893, to the out-patient department for diseases of the ear, nose and throat, in the Presbyterian hospital.

It was then stated that the patient was attacked with pain in and behind her *right* ear about November 10, and that there had been shooting pains across her head, probably due to an attack of gripe with which, in my opinion, she was still suffering, when brought to the hospital. On the evening of November 23, the patient had experienced sudden relief from all pain in her ear and head, and was able to sleep for the first time in two weeks. She felt well on rising on the morning of November 24, and continued so until 9 a. m., when she suddenly began to vomit, and, according to her mother, showed a slight fixation of her eyes and apparently was unconscious for a few moments. From that time, until her admission to the hospital, five or six hours later, the patient suffered with violent frontal headache, worse over the *left* eye.

The girl was admitted to the hospital ward as an ear-patient under the care of the writer, November 24. Her temperature at this time was 102.3° F. Respiration 30; pulse 108. Tongue furred and white, expression of face dull and apathetic; she answered questions slowly, and complained of severe pain over left eye only. There was a purulent discharge from *both ears* which has been chronic for years, but no cause was assigned for its origin. Temperature ranged from 101.2 on the 24th to 103 on the 25th, falling to normal on the 26th, then rising again to 101.6 on the 28th. It then fell slowly to 98° on the 29th, then rose to 99.8 on the same day when it again began to fall, reaching 97° by December 1. The temperature remained then subnormal, reaching 96° on December 5. On December 3, patient vomited without relation to ingestion of food. By December 6, temperature rose to 99°, falling the same day to 97.6°. On the 8th and 9th temperature ranged between 98.4 (5 a. m.) to 97.8 (4 p. m.) On December 15, the temperature was 97° at 11:20 p. m. when the patient had a convulsion. The pulse was sometimes subnormal when the temperature was subnormal.

As the subnormal pulse and temperature manifested themselves with increasing pain in the vertex and occiput, the presence of a cerebral abscess was diagnosed. Accurate localization of the abscess was not possible as the headache was in the median line; the

¹ Read in the Section on Otology and Laryngology of the College of Physicians, of Philadelphia, February 6, 1894.

pupils were equally dilated and dilatable, and there were no motor symptoms to guide in diagnosis of central disorder. The presence of chronic otorrhea in both ears also forbade a definite conclusion that the abscess was upon the right side rather than upon the left, although there had been some pain in the right ear before the patient was admitted to the hospital, probably due to a dissecting abscess the size of an almond kernel, upon the posterior wall of the auditory canal which was opened after her admission to the hospital ward.

After the convulsion on December 9, at 11:20 p. m., there was extreme flexion of the left arm over the chest, and increased knee-jerk and some ankle-clonus on the left side. At this time the right pupil was extremely dilated and immobile. At intervals the spasm of the left arm would relax. The respiration was of the Cheyne-Stokes type. At 12:33 a. m. December 15, about an hour after the onset of the convulsions, the pulse was 120 and the temperature 97° F. The reflexes were completely absent, excepting in the conjunctiva, and the patient entirely comatose.

Operation. The resident physician had been directed to call upon the general surgeon on duty whenever the symptoms in this case should seem to demand an operation upon the cranium for relief. Consequently Dr. DeForest Willard was summoned and proceeded to trephine the skull about an hour after the convulsions began. The operation was begun without ether, owing to profound unconsciousness of the patient. Dr. Willard began with the intention of opening the mastoid and antrum cavities, but the density of the mastoid and the slowness in the operation it necessitated, together with the alarming condition of the patient induced him to abandon the intention and proceed at once to trephining the cranial wall, which he did, one and one-fourth inches behind the external auditory meatus, and one and one-fourth inches above Reid's base line, removing a button one inch in diameter. The abscess cavity was found near the surface in the substance of the temporo-sphenoidal lobe and slightly above the trephining opening. There was some hemorrhage from the lateral sinus, and about $\frac{1}{2}$ ounce of exceedingly fetid greenish pus escaped from the opened abscess. At once the right pupil began to contract. The abscess-cavity was then washed out with a warm solution of boric acid. As this solution was injected into the abscess-cavity the right pupil again dilated, and when the fluid escaped the pupil again contracted. The hemorrhage from the lateral sinus was checked by an iodoform gauze packing. A drainage tube was

then put into the abscess cavity and packed around with iodoform gauze. The external ear was occluded with sterilized cotton, and then a sterilized dressing placed over all.

The condition of the patient, during the operation, before the pus escaped from the brain, was very bad. Her pulse once reached 184, but as soon as the pus was liberated the patient's condition improved greatly. The operation lasted nearly an hour, after which the temperature was found to be 99.6° F., pulse 130 and respiration 28; pain in her head ceased and the pupils reacted normally. From the evening of November 10, until December 25, the patient's temperature was mostly *subnormal*, being normal once, viz: December 22. On December 5, it was as low as 96° F., and on December 21 and 23, it was 98.8° and 99° respectively. The pulse varied with the temperature from 68 to 80. On December 25, the temperature became normal and remained so.

The drainage tube was removed on December 16; no discharge from abscess cavity; still considerable discharge from the right ear, and some from the left ear. The packing was removed from the lateral sinus; no hemorrhage.

December 20. General condition excellent; appetite good; no pain in the head.

December 31. Has gained considerably in weight; intellect has improved; much less discharge from the right ear.

January 10, 1894. Patient still improving; pupils and movements of eye balls normal; has not menstruated since her admission to the hospital.

January 20. General condition very good; opening back of ear almost entirely closed.

February 3. There is a copious, creamy, purulent discharge from both meatuses. No vestige of membrana tympani or ossicles discernible in the right tympanic cavity. No bare bone felt. There is some cholesteatomatous matter in the right tympanic cavity. The patient hears entirely with the left ear.

From the absence of any sign of bone lesion (denudation or necrosis), in the drum cavity or mastoid, and from the rapid and entire recovery from the brain abscess, we may conclude that the latter was embolic in origin. The attack of grippe from which the patient apparently suffered early in November, set up an acute inflammation in the chronically congested drum-cavity, and septic matter was probably conveyed by an enlarged vessel to the brain-substance resulting in the abscess in that structure.

127 South Eighteenth Street.

ON THE PROPRIETY OF USING STIMULANTS,
TONICS, AND INCREASED NUTRITION IN
RELIEVING THE PAIN OF ACUTE
OTITIS MEDIA.

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IN acute suppurative or catarrhal otitis, the pain is often intense, and likely to continue for some days unless relieved, thereby interrupting the patient's sleep and nutrition, and, after a time, reducing his strength so that he presents a most demoralized and woebegone appearance. This may sometimes occur in spite of previous leechings, applications of dry or moist warmth to the ear, aural douche, or even the internal administration of narcotics. In certain cases I have seen the leech, which is usually so valuable, add to the distress of the patient, and the other remedies already mentioned seem to act quite the opposite to what is usually expected of them. I conclude that the prolonged pain, the disturbance to sleep, and the interrupted nutrition have contributed to bring about a new condition—that of more or less profound depression on which the continued pain may largely depend—in other words, a neurotic condition similar to that obtaining in painful or neuralgic conditions gradually.

I am inclined more and more to the opinion that pain in general, not dependent on a positively inflammatory condition, is likely to depend on a depressed systemic state, requiring for its management rest, or stimulants, or tonics, or food, or all these combined. Perhaps an inflamed ear would be the last thing to be thought of as being amenable to such treatment, but for some years I have felt more and more that the general condition of the patient was worthy of careful attention, and have found that rest, stimulants, tonics and improved nutrition were often essential to the patient's recovery. Recently a striking example of these truths occurred.

A gentleman, of about 60, had an attack of suppurative otitis media of his right ear. Two physicians, one of whom was his son were in attendance. He progressed fairly well for ten days or two weeks, when his physicians found that leeching seemed to aggravate the pain and that morphine acted unsatisfactorily, as well as

the other remedies. I was called in with the idea of operative interference, and after observing the case, concluded that the element of depression largely predominated and had much to do with the painful condition, although his temperature was $99\frac{1}{2}$. The ear was freely suppurating and the perforation whistle was easily elicited. The perforation was in the anterior inferior portion of the membrana. Some of the time there seemed to be tenderness over the mastoid, but after repeated tests I concluded there was none. The pain radiated over the side and back of the head, and also extended into the neck.

His son remarked that he had previously had pain in the occiput and neck when he was not in his usual good health or was eating badly. All these symptoms, with his cold extremities, pale, cool face, and generally neurotic condition, induced me to order rum or brandy sufficient to relieve his sufferings, only stopping short of the physiological effect. Jamaica rum was freely administered, and on a subsequent visit, six hours later, the patient was found completely relieved from pain.

Large doses of cinchonidine, even to the physiological effect, was ordered together with active exhibition of nutritives. He progressed satisfactorily for about ten days, when I was again called in.

A similar condition to the former state was observed, I suspect from relaxation of the treatment recommended, and I repeated the former instructions. The patient was again promptly relieved; the ear was still discharging, for which peroxide of hydrogen was ordered. It will be noted here that the elevated temperature was brought to the normal by the exhibition of stimulants, the cinchonidine not being used in the first instance. One indication for the use of alcoholic stimulants in some of these cases is the tolerance of the patients to its action; much may be taken without producing the physiological effect.

Some time since I had occasion to prescribe for a physician who had a suppurative otitis of ten days duration. There had been considerable pain, and the patient showed signs of his suffering in his facial expression, and in a general way the depressing effects of the disease was apparent. The ear was freely suppurating. I gave him to distinctly understand that the first step in his cure was to restore the energy lost by suffering from the disease, and the interrupted nutrition by the use of alcoholic stimulants pushed to a near approach to the physiological effects, also accompanied by tonics and as much food as he could comfortably digest.

He left me with an amused smile, provided himself with the necessary stimulants, and inviting a near friend to assist, proceeded to carry out the instructions.

After a time the friend was somewhat overcome from his somewhat excessive potations, but the patient who had taken an equal amount was much improved in every way, without the slightest approach to inebriation. He dated his rapid recovery from this successful starting point.

Some years ago I was called in consultation with two other medical men in the case of a lady, aged 50, who had an acute catarrhal otitis media accompanied by considerable pain. One of the doctors present thought there was mastoid tenderness and was in favor of operating. The other physician and myself opposed this notion, each believing that the pain in the ear and side of the head was rather neuralgic than inflammatory in character, and advised large doses of cinchonidine (10 grs. every three hours). Alcohol was interdicted as the patient was inclined to the abuse of stimulants. The pain was quickly and permanently relieved.

Nourishment was naturally looked after. I could adduce a large number of such cases to illustrate the matter under discussion.

Recently at the New York Polyclinic I had a patient with a sharp attack of catarrhal otitis media. The usual remedies such as leeches, hot applications, etc., were prescribed, I remarking that as the patient seemed robust, that alcoholics would not be necessary.

The patient naturally overheard the observation.

A few days subsequently, she informed me that failing to get relief from the means I had suggested, she had tried whisky and abundantly succeeded in being freed from pain. These considerations remind me of certain practices in the West—when a patient is suffering from malaria with neuralgic symptoms and fails to get on with the usual routine treatment, it is sometimes the practice to saturate them with whisky, when the patient suddenly takes a fresh start in the direction of recovery.

A few years since a medical man in New York, editor of a leading medical journal, was attacked by an otitis, for which a great variety of means were used, including a mastoid operation, without relief.

On consultation with a gentleman devoted to general medicine, the question was raised that the patient had, for a long time, been overworked, and the prolonged suffering had so reduced his energies that a genuine neurotic condition existed, for which whisky was recommended.

On the first day a full bottle was administered, followed up with a sufficiency to maintain the effect, and he was speedily cured of prolonged and painful otalgic symptoms.

ALARMING SECONDARY HEMORRHAGE FOLLOWING THE REMOVAL OF HYPERTROPHIC TONSILS WITH THE GALVANO-CAUTERY SNARE.

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THE oft agitated subject of tonsillar hemorrhage was vividly brought to my immediate attention in the case which I herewith report. After hearing and reading the opinions of authorities, who extol the galvano-cautery as the only safe method for the extirpation of enlarged tonsils, one naturally hesitates to bring simpler and more rapid means into service, though personal experience with same has not been marred by serious consequences.

Fully appreciating the safety which lies in the cautery as a valuable hemostatic, the following history acquaints us with the knowledge that alarming bleeding may occur after its application, though the usual symptoms of pain, swelling and inflammation have subsided. The special feature in this instance is the appearance of hemorrhage five days after the removal of the tonsils, when the condition of the throat warranted a discontinuance of further attention. I quote the history of the case in detail, trusting it may prove of some interest:

Mr. C., a medical student, aged 21, presented himself at my office January 29, 1894. He desired an opinion as to whether his enlarged tonsils could be removed with safety. For fifteen years he has had repeated attacks of follicular tonsillitis. In the winter he would have a sore throat every week, but during the milder seasons these were only experienced on exposure to a moist atmosphere. Whenever the trouble would manifest itself, both tonsils would swell to such a size as to meet in the median line, squeezing the uvula between them. This condition was so annoying, that a physician in attendance advised the amputation of the uvula. The pain during the acute condition was severe. The tonsillitis was never unilateral. It would last about seven or eight days; the swelling of the tonsils would then diminish, but not to a comfortable degree. During the inflammatory stage, Mr. C. was unable to swallow solid food; not on account of the pain, but owing to the immense masses almost completely closing the faucial space. He existed on a milk diet throughout these exacerbations. Even

during the absence of acute symptoms, the patient experienced considerable difficulty in deglutition, as these enormous tonsils prevented the passage of food into the lower pharynx, unless masticated into a fine pulp. Mr. C. stated that he was the last to leave the table, because he had to so thoroughly chew his food for fear of choking.

Nasal respiration was found to be obstructed during non-inflammatory periods. When the acute trouble appeared, he had to sit up in bed to breathe. He has been awakened from sleep in one of these attacks with a suffocative seizure, and had to leave his bed to get air.

On examining the young man's throat, was astonished to find such immense growths existing in an individual's fauces for fifteen years, without some radical attempt having been made for their reduction. No active inflammatory signs were then visible, but the tonsils almost touched each other. They moved backward and forward on forced respiration, as if on pedicles. The uvula was pushed to the right by the left tonsil, which was the largest hypertrophy I have ever seen. The right tonsil was about two-thirds the size of the left one. The chink between the growths was certainly not over a fourth of an inch in width.

Personally, I have never had a serious hemorrhage, either in a child or adult, following extirpation of the tonsil with the cold instrument, but this overgrowth of tissue presented so formidable an aspect, I advised their removal by means of the galvano-cantery snare, to avoid the possibility of secondary bleeding.

A week later, February 5, 1894, Mr. C. returned, and in the presence of two fellow-students, had both tonsils excised under cocaine. The operation was not difficult; both growths being easily surrounded by the snare. No bleeding followed the incision of the cherry-heated wire. The left tonsil after its removal was as large (to use the patient's words), as a good-sized chestnut burr. Mr. C. was startled on seeing its proportions. A solution of boric acid was prescribed to be used as a gargle, together with pieces of cracked ice and the usual liquid diet. The same evening he had considerable pain. I saw him the next day and found marked edema of the anterior and posterior palatine pillars, left side, together with the same condition of the uvula, which had adhered to the posterior pillar. The right side of the throat was inflamed, but not edematous. He had been sucking ice, and it gave him some relief. As expected, the eschars were extensive, and to guard against infection ordered a solution of bichloride of mercury in hydrogen peroxide, fifteen volumes, to be sprayed into the mouth every fifteen minutes. This combination acted very kindly both to the constant pain, and in easing the act of swallowing. Three days later, Thursday, February 8, the edema had almost entirely disappeared, and the uvula returned to its normal position. On Friday, February 9th, finding the throat healing so nicely did not think it necessary to again visit my patient, so informed Mr. C. to present himself at the office in a day or two.

Was surprised to receive word on Saturday morning, February 10th, that he had an alarming hemorrhage during the night. On my arrival found patient in bed, (he was only confined to his room before this), with an exsanguinated countenance. His pulse was rapid, regular, but weak. He informed me in muffled tones, that just before retiring, about 11 o'clock Friday night, he noticed a slight bloody discoloration of his sputa. There

was also some pain in the left ear but it was not severe. While in bed he expectorated a number of times, but the sputa was again clear, and therefore did not give him any cause for worryment. About 1 o'clock a. m., he was awakened with an agonizing pain in the left ear and a flow of blood into the throat almost choked him. Sucking pieces of ice failed to arrest the bleeding, but so intensified the auricular pain that he could not hold any ice in his mouth. Hot water douching did not relieve the excruciating pain in the ear. The hemorrhage from the left tonsil, evidently due to the loosening of the eschar, lasted for fully five hours, and was finally controlled by a spray of cocaine, four per cent, used by Dr. Stone, who was hurriedly summoned. Two hours later the bleeding recurred and continued for four hours. I arrived at the cessation of the second hemorrhage, and found that a very large clot had formed. The cocaine spray had again checked the bleeding.

The entire left faucial space was filled with the clot, which further extended beyond the median line, midway between the uvula and right palatine pillars. It also reached into the lower pharynx, causing great discomfort. Mr. C. attempted to swallow water, but it would not "go down" as he expressed it, showing the area the clot occupied. He did not take any nourishment for twenty-four hours, fearing to dislodge the clot and re-excite the bleeding. The hydrogen peroxide spray was continued every fifteen minutes. Its peculiar properties aided materially in loosening the large clot, which came away easily Saturday evening about 6 o'clock. Slight oozing of blood followed but it was promptly stopped by a spray of an alum solution, a drachm to the ounce. Mr. C. was then able to take liquid nourishment. Half a glass of milk with a teaspoonful of whisky was taken through a glass tube, the latter being placed to the right side of the fauces, so as to avoid disturbing another clot which had formed. (This procedure was accomplished in my absence, following the original routine). The liquid was swallowed successfully without any further bleeding. The fluid diet was continued until the following Tuesday.

On Wednesday morning, February 14th, Mr. C. was able to come to the office. The wounds had healed pleasantly. Slight soreness still existed in the pharynx, but no pain manifested itself during the act of swallowing. His voice which before the operation was characteristically muffled, was now clear and resonant. This improvement was noticeable to the patient. He volunteered the information that his sleep the last two nights was the most refreshing he has enjoyed since early childhood.

At the time of his distressing aural pain, the tympanic membrane was inspected, but I could find no evidences of an acute inflammatory condition. Whenever the inspired air would strike a certain spot in the left side of the throat, the pain in the ear would be severe. The cocaine solution when sprayed on the part would bring immediate relief, showing that some filament of the glosso-pharyngeal nerve was exposed.

The unusual secondary manifestations in my case impress the necessity of carefully observing the after-effects of the galvano-cautery, and do not warrant scouting the possibility of hemorrhage after its use.

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A CASE OF TORTICOLLIS FOLLOWING REMOVAL OF
ADENOIDS OF THE RHINO-PHARYNX, WITH
REMARKS ON NASAL REFLEXES.¹

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IT seems almost necessary to apologize for again referring to a topic so threadbare as that of nasal reflexes. My excuse for so doing is the recent occurrence in my own experience of an instance of reflex disturbance which I believe to be rather uncommon and of unusual interest. In these days of rhinological enthusiasm we should not be surprised to find that almost every possible functional derangement has been at one time or another attributed to an intra-nasal lesion. After sifting out the genuine cases from those which are the product of illogical inference, we have a list of considerable length, containing certain examples which are easily recognized, and are of frequent occurrence. Among these may be mentioned bronchial asthma associated with nasal polypi. Yet we shall probably find it difficult to follow certain modern observers to their conclusion, that all or even a large proportion of cases of asthma are due to some deformity or disease of the nasal fossæ. As an illustration of the extreme to which the human mind may be led in pursuit of a theory, witness some of the extraordinary cases quoted by Hack in his well-known papers on nasal reflexes. Gastralgia and dyspepsia, cardiac palpitation, salivation, scotoma, agoraphobia, exophthalmic goitre are among those enumerated. Other observers have reported cases of chorea and epilepsy, of nocturnal enuresis, and of neurasthenia, one writer asserting of the last mentioned disease, that he has not seen a single case of it without co-existing catarrhal trouble. This last statement loses a little of its startling character in view of the pre-

¹ Read before the Neurological Section of the Academy of Medicine, February 16, 1894.

valence of catarrhal disease in this climate. A case of glaucoma, not relieved by iridectomy, is reported to have been cured by removal of a nasal polyp, and rheumatic muscular pains are said to be not infrequently dependent upon nasal disorders. Thus far the present popular "fad"—appendicitis—has, I believe, escaped the soft impeachment. While intra-nasal lesions have been accused of promoting all sorts of disorder, the rhino-pharynx has not been altogether exempt from suspicion, and the number of authentic cases of rhino-pharyngeal reflex has become quite large.

Cases of hysterical aphonia, in which the voice was promptly restored by cauterization of the posterior ends of the inferior turbinated bodies, have frequently occurred in my own experience and in that of others, and may, perhaps, be included in this category, since in its enlarged condition, the end of the inferior turbinated is an occupant of the upper pharynx. It must, however, be admitted that in cases of this class almost any profound impression upon the nervous system would be likely to accomplish a similar result. A more appropriate example of true rhino-pharyngeal reflex is to be found in a case like that reported by Casselberry, (*Trans. Am. Laryngol. Ass'n.*, Vol. xv, 1893, p. 9), of laryngeal spasm excited by the application of a strong spray to the vault of the pharynx of a girl, fifteen years old, with enlarged faucial and pharyngeal tonsils. On a subsequent occasion, the passage of a probe into the rhino-pharynx induced a spasm so violent and prolonged that unconsciousness supervened, and tracheotomy was contemplated. A curious fact in connection with this case is that removal of the adenoids was effected under cocaine without apparently producing a spasm.

According to Bosworth, adenoids in the vault of the pharynx may become, "in rare cases," a source of reflex symptoms, and, in a paper on "Chorea minor from naso-pharyngeal reflex," (*Am. Jour. Med. Sci.*, April, 1886, p. 517), Jacobi gives a graphic picture of lymphoid hypertrophy in the vault of the pharynx as an exciting cause of various muscular anomalies.

Tornwaldt, of Danzig, in his well-known thesis on the "Bursa pharyngea," refers to reflex cough as a symptom of hypersecretion or of cystic degeneration of the bursa. In his monograph on "Hyperplasia of the pharyngeal tonsil," Trautmann, of Berlin, gives especial attention to the reflex symptoms associated with this condition, of which he cites numerous interesting examples. Several cases of reflex cough have been reported by Hering, of Warsaw, (*Rev. mens. de larynologie*, April, 1886, p. 177). In

one of these torticollis and painful spasm of the muscles of the neck succeeded immediately upon electric cauterization of the pharyngeal wall. The muscular disturbance persisted for nine days, and ceased only with the cicatrization of the wounds. A neuritis resulting from irritation of a nerve filament in the neighborhood of a cauterized point is thought to have provoked the reflex phenomena. It should be noticed that in this case the traumatism was inflicted upon the pharyngeal wall rather than in the vault of the pharynx. A case of spasm of the glottis with dyspnœa from chronic pharyngitis, reported by De Gennaro, (*Arch. Ital. de Laringol.*, An. vi. f. 3 and 4), suggests a possible frequent relationship between adenoids and laryngismus in children. A similar observation has been made by Ragoneau and by Coupard. I have myself operated upon a little girl, the child of a physician, who was subject to frequent and alarming attacks of glottic spasm, especially when excited. Since the adenotomy, more than two years ago, there have been only two attacks, and those were of moderate severity. In his elaborate paper on the "Hysterogenic zones of the upper air passages," Lichtwitz, (*Rev. mens. de laryngol.*, Dec., 1886) refers to a case in which the posterior surface of the velum was the seat of what he calls a "lethargogenic zone." He gives records in all of six cases exhibiting an interesting variety of reflex phenomena. Three remarkable cases have been reported by Netchaieff, of Moscow, (*Abstr. in Jour. of Laryngol.*, etc., March, 1889). In one, the right middle turbinated was enlarged, and a papilloma the size of a cherry stone, lay between the left Eustachian orifice and the choana. The patient had aphasic symptoms followed by numbness, pricking and spasmodic twitchings of the right hand and right side of face. All disappeared when the morbid conditions in the nose and rhino-pharynx had been remedied. The second case was one of œsophagismus, associated with dyspnœa, in which the right inferior turbinated was hypertrophied, and the corresponding half of the posterior wall of the pharynx was thickened. Relief followed the use of the galvano-cautery. Both of these cases were adult males. In the third case, that of a lady, subject to attacks of dyspnœa, palpitation, headache and giddiness, a cure resulted from two applications of chromic acid to an enlarged right inferior turbinated. In a paper read before the Am. Laryngological Association in 1889, (*Trans. Am. Laryngol. Ass'n.*, Vol. xli, p. 43), J. N. Mackenzie expresses the opinion that the nasal pharynx, in quite a large pro-

portion of individuals, is exceedingly sensitive to reflex-producing stimulation and that the areas chiefly involved are the posterior ends of the turbinated bodies, and the upper and posterior portions of the cavity. Not to detain you with numerous references to the literature of the subject, suffice it to say that all authorities who take any notice of the matter concur in the opinion that adenoid hypertrophies in the vault of the pharynx may be the exciting cause of reflex disturbances in the larynx and elsewhere. I may add that a pretty thorough search has failed to discover on record a case precisely identical with the one about to be narrated, and it is the first of its kind occurring in my own observation. But few writers on this subject refer to such a complication as a possibility.

The following case came to my clinic at the Manhattan Eye and Ear Hospital in the Spring of 1893, giving a typical history of adenoids in the rhino-pharynx and presenting the characteristic physiognomy.

The case will be reported in detail by Dr. McKernon in the forthcoming volume of Transactions of the Hospital:

The patient was a girl, aged 9, who had been a mouth breather ever since a course of measles, eighteen months before.

She had had frequent attacks of earache and the hearing was decidedly impaired. She was assigned to Dr. McKernon for operation, but the patient disappeared and did not come again to the clinic until last October. At that time her general condition was very bad, but the nasal occlusion was so complete that immediate operation was felt to be imperative. Accordingly she was etherized and three scrapings were done with the Gottstein curette, the first two, of the vault, and the last, of the posterior wall of the pharynx. It is quite certain that no unusual force was exerted. No difficulty was met with in the manipulations, and only an average amount of blood was lost.

Twenty hours after the operation, it was noticed that the patient carried her head with the face turned towards the right shoulder, and it was found that she was unable to move it back.

Forced rotation and flexion of the head were painless, but extension was painful, and a sensitive point was discovered just to the left of the cervical vertebrae. There was no perceptible rigidity of the superficial muscles at the back of the neck, and the anterior cervical muscles were quite flaccid. There was only trifling rise of temperature, but the child looked sick, refused to eat, and was restless at night. She did not complain of spontaneous pain or discomfort in swallowing. The appearance of the pharynx forty-eight hours after operation was peculiar. The mouth being open, the lower limit of the wound, made by the curette, could readily be seen considerably below the plane of the velum. The surface of the wound was foul and sloughy. Its margins were angry and swollen, particularly below and to the right, where there appeared to be a mass of partially everted mucous membrane of lymphoid tissue. During the succeeding twenty-four hours improvement began. In the course of ten days the rigidity of the head, and the traces of the pharyngeal operation disappeared.

In the meantime the transformation in the general appearance of the child was remarkable. She gained in flesh, and improved in color. Her previous heavy, stupid expression of countenance was replaced by one of brightness and intelligence. Her breathing, hitherto labored and snoring, especially at night, was tranquil, and in speech there was very noticeable increase of vocal resonance. In short, an unhealthy and rather dull child had been converted into one of more than ordinary vigor and attractiveness by the simple process of restoring the nasal respiratory track to its normal condition.

The early post-operative symptoms in the foregoing case were somewhat perplexing, but it gradually became clear that we had to deal with a simple condition of tonic muscular spasm.

The clinical study of reflex neuroses is always attended by more or less difficulty. For example, a case of asthma of fifteen years duration is now under my care, who had very aggravated chronic rhino-pharyngitis and chronic lacunar amygdalitis, the right tonsil being especially large and diseased. This patient was given hydriodic acid internally, and a detergent antiseptic spray for the nose and pharynx. In addition, the tonsil has been partially destroyed with the electric cautery. For the first time in many years she is now getting undisturbed sleep at night, and has had no asthma for several weeks, but up to the present moment I am equally uncertain as to the cause of her asthma and the source of her relief. To further illustrate the confusion to which we are liable, let me refer to a case reported by Harrison Allen of what he calls "paresis of the suspensory apparatus of the hyoid bone of the tongue," in a victim of adenoid hypertrophy and enlarged faucial tonsils, in which the familiar phenomenon of labored and interrupted respiration during sleep is described (*Trans. Am. Laryngol. Ass'n.*, 1886, p. 4). This child had recently suffered from a severe attack of whooping cough which may have had some bearing upon the suffocative attacks. In discussing Dr. Allen's paper, Hooper related a case of chorea developing about two weeks after removal of adenoids under ether, in a child of marked neurotic tendency. The length of the interval may be thought to exclude the idea of an etiological relationship between the operation and the neurotic development.

In order to appreciate more readily the ease with which lesions and pathological conditions of the rhino-pharynx may become the exciting cause of reflex disturbance, let us recall, very briefly, a few points in the anatomical structure and relations of this cavity.

The wall of the pharynx is composed of mucous membrane, a layer of submucous fibrous tissue and various muscles. Its vault is formed by the body of the sphenoid bone and the basilar process of the occipital bone, to which are attached aponeuroses and ten-

dons of several muscles which enter into the construction of the pharyngeal wall and control certain movements of the head. From the pharyngeal spine, midway between the foramen magnum and the anterior margin of the basilar process, spring a few tendinous fibers of the superior constrictor muscle. Just to the outer side of the spine is attached the rectus capitis anticus major muscle, and directly behind it, the rectus minor. The former muscle arises from the tubercles of the transverse processes of the third to the sixth cervical vertebrae inclusive; the latter from the anterior surface of the lateral mass of the atlas and its transverse process. The recti muscles are flexors and rotators of the head. Their nerve supply is derived from the suboccipital and deep internal branches of the cervical plexus, and they are in close relation with the superior cervical ganglion of the sympathetic. The mucous membrane lining the rhino-pharynx is especially rich in blood vessels and lymphatics, and its nerve supply is thus described by Wendt in Ziemssen's *Cyclopedia*: "The second division of the trigeminus gives branches to the roof of the pharynx and the parts surrounding the Eustachian orifices. The mucous membrane is also supplied by filaments from the glosso-pharyngeus and the vagus, with which fibers from the sympathetic connect." Speculation as to the precise mechanism of reflex neuroses is perhaps profitless, although we may not be fully inclined to agree with a reviewer of Woakes' book on Nasal Polypus, who writes in the *Journal of Laryngology*, March, 1888, imploring "one undoubted experimental proof that these isolated ganglia (e. g. Meckel's, the superior cervical, etc.), possess afferent and efferent nervous systems, and can become centers of reflex action. There is nothing to support such a contention beyond assumption and assertion, and the mischief of it is that those who write most profusely of the disturbances of the "sympathetic system" (that much abused nervous chain), show the slenderest acquaintance with physiology."

On the other hand it is the belief of Mackenzie (*Trans. Am. Laryngol. Ass'n.*, 1886, p. 154), whose contributions to this subject have been numerous and valuable, that "these affections are intimately related to some disturbance of the sympathetic nerves, and probably a deranged condition of the vaso-motor centers themselves."

There seem to be three ways in which the train of symptoms occurring in this case might have been produced. 1. By an actual wound of the rectus muscle. 2. By a contusion of the muscle from extraordinary pressure in curetting. 3. By a lesion of nerve

filaments in the mucous membrane resulting in a reflex irritation of the muscular fibers engaged in rotation of the head.

The first may be at once excluded by the behavior of the wound and by the appearances on completion of repair. The second may be eliminated on the testimony of an experienced and careful operator who disclaims the use of more than ordinary force. One suspicious point in this connection is the localized tenderness to the left of the cervical vertebrae. The third theory seems to give a satisfactory interpretation of the symptoms, especially in view of the evidently neurotic temperament of the patient and the depressed state of the general health. Although the occurrence of torticollis as a sequel of adenotomy is not a very serious matter, it may perhaps be avoided by bearing in mind the fact that as we descend the posterior pharyngeal wall the layer of lymphoid hyperplasia becomes thinner.

We may, therefore, accomplish a radical removal of these so-called vegetations by a relatively superficial use of the forceps or the curette in that situation.

This point also has a bearing upon a method of operating which I have long practiced and recommended in cases in which the lymphoid tissue is found to be distributed at a low level in the pharynx, namely, in ploughing up from below with the nail of the forefinger the adenoid tissue of the posterior wall before the application of instruments.

The use of the finger in this way has a double advantage. We may thus more exactly estimate the degree of force required without going to an excessive depth, and we thereby so accumulate the morbid tissue in the vault of the pharynx as to ensure the extraction of a larger proportion with the first introduction of the forceps.

Finally, although my personal experience is too limited to justify a definite conclusion, the scanty testimony available would seem to indicate that the posterior wall, rather than the vault of the rhino-pharynx, is the site whence these motor disturbances emanate.

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IS LARYNGITIS SICCA AND STOERK'S BLENORRHOEA OF THE LARYNX ONE AND THE SAME DISEASE?¹

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IN the year 1874, Stoerk described a certain disease of the larynx prevailing in some parts of Austria. In 1880, in his textbook² on laryngology, he gave an exhaustive description of it, citing the history of eleven cases. Stoerk pronounces this disease a condition in which the entire mucous membrane, extending from the nose down to the trachea, is changed into a pus secreting surface, causing the formation of crusts in the larynx and trachea. In consequence thereof, there is a tendency of the parts most affected—as the anterior portions of the vocal cords—to form adhesions, and afterwards pure hyperplasia. These parts, protected as they are by the epiglottis and the nodus epiglott., invite putrefaction. For this reason, the same goes on undisturbed and reaches its greatest intensity. Accordingly, stagnation of pus occurs in these places, ulceration and adhesion follows, and finally hyperplasia. This disease is most prevalent in Galicia, Poland, Wallachia and Bessarabia. In these countries, the endemic occurrence of this disease appears to be associated with social quite as well as with telluric and climatic conditions. The largest number of patients thus diseased are those living materially in the midst of poor and filthy conditions, which are found in these countries more than elsewhere.

Since Stoerk's last publication, however, with few exceptions, this subject received but slight attention in writing or discussion.

¹Read before the Medical Society of the State of New York at its Eighty-Seventh Annual meeting, February 9, 1893.

²Carl Stoerk, *Klinik der Krankheiten des Kehlkopfes, etc.*, Stuttgart, 1880.

Having been unsuccessful in finding any American literature whatever, touching this matter, it appeared to me that this disease has remained entirely unknown in this country.

For the past seven years, the material in my department of the German Poliklinik, vast in numbers of people coming from those parts of the world which Stoerk especially mentions, it is surprising to say that I have not as yet met a case of Stoerk's blennorrhœa. For the first time this winter I encountered two cases, one of which answered exactly the symptoms described by Stoerk, while the other, an outspoken case of laryngitis sicca, brought to me the conviction during treatment, that this disease was nothing but an early stage of Stoerk's blennorrhœa. A remarkable feature of the first case was that the woman was born in New York, and that her parents had never been in Poland or Galicia. The case in brief is the following:

Mrs. Annie R., aged 24, was born in the city of New York. Both her parents came from Bavaria, and arrived in America years before her birth. She always lived in the United States, and cannot remember having come in contact with people from Poland or Galicia. She is dressed plain, but neat and clean, and does not impress one as having been reared in unclean surroundings. She is married to a man enjoying perfect health, and has borne one healthy child. She never had any eruption on her body, and always felt well, until she became hoarse four years ago. At that time, she had no pains and no dyspnea. Three years ago, she began to be annoyed by scratching in her throat. Afterwards she began to cough and a slight dyspnea set in. These symptoms have remained permanent, with the exception that they became more severe and that her voice is now entirely aphonic. Her nose felt sore as long as she can remember, and there is a secretion of a fetid and mostly purulent character. The patient is so timid that she postponed consulting a physician until a few weeks ago, and for unknown reasons she left him soon after.

On my first examination, I found the mucous membrane of the nose in a very atrophic condition, with a slight hypertrophy of the middle turbinate body of the right side. There are stinking crusts on both sides, mixed with pus. In the pharynx, the mucous membrane was hard as leather, shining and atrophic. The larynx has the exact appearance as that described by Stoerk. The entire mucous membrane has been transformed into a gray, yellow-greenish surface. At the anterior angle of the vocal cords in particular, a mass of dried greenish pus adheres, the removal of which was not possible without some difficulty. After the larynx had been thoroughly cleansed by means of a powerful spray, in the anterior commissure, a narrow adhesion of the vocal cords became visible. The spray I use in these cases is an exception to my general rule, for I have entirely given up the use of such for ordinary purposes. Posterior to this, and upon the inner surface of the left vocal cord, a small ulceration came to view. The whole vocal cords are thickened. A more marked thickening presents itself below the left vocal cord, and seems to be a true hyperplasia.

The width of the glottis is narrowed, and the voice of the patient is aphonic. In the trachea there are still some stinking crusts, and the anterior wall of it is thickened as far down as one can see. After a very careful examination, phthisis and syphilis are to be excluded.

The second case, which I now cite, is Mrs. Lina P., aged 28. She and both her parents were born in Galicia, and ten months ago immigrated to the United States. She is married ten years, has two living children, and since three months is pregnant again. Three years ago she became hoarse and was treated successfully for three weeks at Jaroslaw, (Galicia). Soon after her throat again troubled her: she felt that everything was drying in her throat, which sensation has never left her since. After her arrival in this country, she visited a dispensary, but soon left unrelieved. Besides her old troubles, six months ago, however, she acquired dyspnea, which in the last few weeks became so alarming that she sometimes thought she would suffocate.

On my first examination, I found an atrophic rhinopharyngitis, nose and pharynx coated with many inspissated crusts. The mucous membrane of the larynx was, to such a degree, atrophic and shining, as is only seen in extreme cases of pharyngitis sicca; the vocal cords throughout their length thickened. On the right arytenoid cartilage was a mass of dried stinking secretion; also below the vocal cords and in the trachea, as far as you could look down, these masses were present. The woman is aphonic and dyspnoic, gasps continually for breath. She lives in one room with her whole family, consisting of six persons, looks, and is dressed extremely dirty. She has not had the benefit of a bath since being in this country, and leaves her room but twice weekly to visit the klinik.

When I sprayed her larynx and trachea with Dobell's solution, in order to examine the patient, she became so dyspnoic that I thought tracheotomy would be the next step. Only after having succeeded in quieting the woman, sufficiently to enable me to remove a piece of secretion from the trachea with a long forceps, did the dyspnea cease. This dried piece was compact, had an exquisite greenish-black color, etc., *i. e.*, the exact appearance of the nasal secretion in ozena. The patient told me that during the following weeks she had several similar attacks of dyspnea.

While the first case, judging from Stoerk's description, represents an undoubted case of blennorrhœa of the larynx, proving at the same time that this disease may occur outside of the Austrian provinces, that it may even appear sporadically in the far away America. The other case suggested the idea that Stoerk's blennorrhœa must be an advanced development of the much more frequent laryngitis sicca.

The second patient's visits to the poliklinik were so irregular during the first weeks, that a course of treatment was at that time out of the question. The secretions in the larynx and trachea increasing caused, besides a permanent strong dyspnea, a very extraordinary irritating cough. In fact, the patient was constantly hawking or coughing. Under such circumstances, superficial

excoriations were formed, and these places already showed the gray-yellow-greenish appearance, so characteristic in blenorrhœa. The patient, after an absence of two weeks, returned, and then I found that the anterior parts of the vocal cords had grown together. It was not more than natural to suppose that if she again absented herself she would develop in a short time a repetition of the picture I gave you of the first case. She remained, however, under my care, and I am now in such a position to be forced to declare candidly that the patient whom I demonstrated before the German Medical Society of New York as a case of laryngitis sicca, is now after five months untiring medical treatment in that state, that to-day I could demonstrate her as an exquisite case of Stoerk's blenorrhœa, if I believed at all in a special existence of such a disease. In this time, the entire picture has so changed. The glottis is reduced to a small half-moon-shaped gap, lying before the two arytenoid cartilages. Out of the adhesion at the anterior angle, which naturally has moved backwards, a true hyperplasia has been found, extending alongside the edges of the vocal cords throughout their entire thickness. The anterior wall of the trachea is also much thickened, which can be seen well especially by translumination, which I had not utilized before. The crusts with their partly pointed, partly blunted edges, loomed upwards in the trachea, that it presented to the mind the characteristic view of stalactites in a filtering stone cavity. (Schmidhuisen).

We therefore see, to voice the sentiments of Virchow, that a chronic, fibrous, retracting inflammation has set in.

The woman is aphonic, at times hoarse, and suffers from a strong dyspnea which, of course, is augmented by her pregnancy. The principal danger threatening the patient arises from the dried crusts in the trachea, and this alone might necessitate a tracheotomy on this woman. The stenosis in the larynx being ever so small, is nevertheless sufficient to enable the patient to breathe tolerably well. For this reason, intubation would be out of the question. I have to add that in most of my examinations, the dried secretions were found in the anterior angle of the vocal cords, the place of predilection. Very frequently, however, they were seen on all other places of the larynx on the border of the vocal cords, on their lower surface and on the arytenoids.

After having become familiar with the history of these two cases, the next question arising is: How is it that we come in contact daily with cases of rhinitis and pharyngitis sicca, seldom meeting examples of laryngitis sicca, and very rarely outspoken

Stoerk's blenorrhœa? Is it true, that laryngitis sicca is nothing but an extension of pharyngitis sicca?

In answering the latter question, first, there is one point remarkable. The phlegm of the retro-nasal catarrh, of pharyngitis granulosa and sicca goes downwards in accordance with the law of gravity, mostly attacking the esophagus and the stomach, a fact to which attention has been drawn repeatedly by laryngologists. Why does it reach the larynx in so few cases, and how is it that the most tenacious phlegm, the removal of which gave me so much trouble, should be found not only in the pharynx, but also and especially so in the larynx and down in the trachea, whilst the more fluid phlegm usually attacks the *entrance* of the larynx only? Lublinski³ believes that laryngitis sicca is merely a continuance of pharyngitis sicca, and Felix Semon's⁴ remarks seem to coincide with him. I differ from them, as I think that laryngitis sicca must be classed alone as an independent disease. The facts given to you would be quite sufficient to substantiate my statements, but allow me to mention another case as proof positive which in itself is of more than ordinary interest for our present subject. The case was published by Benno Baginsky⁵ under the name of ozena laryngo-trachealis. This case, that otherwise resembled the blenorhœa described by Stoerk, differed in that the larynx alone of the 12¹/₂ year old patient, was affected by the disease, and *not* the nasal chambers, the retro-pharynx and the posterior wall of the pharynx. This was, therefore, a *genuine* disease of the larynx and trachea, making it clear that such a disease is possible, though rare. As a further proof in addition to this, I state that the crusts in many cases of laryngitis sicca choose with preference just that place, which is the least accessible from above, *i. e.*, the anterior angle of the vocal cords.

This, too, is opposed to the theory that the disease originates in the pharynx. But I desire no misunderstanding, and by no means create the impression that it is my idea that out of every slight atrophic laryngitis now, Stoerk's blenorhœa must develop. Of one thing, however, I am convinced that Stoerk's blenorhœa is nothing more than the result of some cases of laryngitis sicca or ozena laryngo-trachealis, especially those which are serious or much neglected. But I will now quote others.

³ W. Lublinski: "Ueber Laryngitis sicca sive atrophica." *Deutsche Medic. Ztg.*, p. 99, 1886.

⁴ *Internat. Centralbl. f. Laryngologic.*, p. 251, Vol. 1.

⁵ Benno Baginsky: "Ein Fall von Ozaena laryngo-trachealis." *Deutsche Med. Wochenschr.*, p. 296, 1876.

It is most peculiar, that with the exception of Stoerk and his school, only few firmly believe in a special form of the disease. Even other laryngologists of Vienna, who also see a great many patients from Galicia and Poland, deny the existence of such a sickness; as for example, Schrötter, to whom we will refer later on. A case of Stoerk's blenorrhœa, presented by Grabower before the Berlin Laryngol. Society, January 10. 1890, was generally doubted as such, even by the former assistant of Stoerk. Dr. P. Heymann.

The other authors I make mention of are Max Bresgen⁶ and Krakauer,⁷ both also former assistants of Stoerk. While Bresgen still upholds Stoerk's opinions, Krakauer differs in that he says: "The process in the larynx has great similarity to the so-called laryngitis sicca, while in the nose it reminds one of the common ozena, and I hold the name which Mr. B. Baginsky substituted for that of blenorrhœa, the name of ozena laryngo-trachealis as a happily selected one." B. Frankel⁸ years ago pronounced Stoerk's creation of a new disease to be without sufficient reason, as secretions dried into scabs with or without smell are to be found idiopathically, though less often than in the nose, in the pharynx and trachea, whenever these organs are attacked by an atrophic catarrh. P. Heymann⁹ and I. Schmidhuisen¹⁰ both plead for a special form of the disease. Gordon Holmes¹¹ and David Newman¹² mention a special form of atrophic laryngitis, without touching the question of Stoerk's blenorrhœa at all.

Schrötter also having drawn attention to the fact that there exists a form of catarrh in the larynx and trachea, characterized by dryness of the membrane, loss of epithelium, excoriations and the like, now adds, as I have lately read in his textbook,¹³ that it could

⁶ Max Bresgen: "Einige interessante Fälle aus dem Ambulatorium des Herrn Professor Stoerk in Wien." *Deutsche Med. Woch.*, Nos. 26 and 27, 1876.

⁷ Krakauer: "Fall von Stoerkscher Blenorrhoe." *Berl. Klin. Wochenschr.*, p. 973, 1887.

⁸ B. Fränkel's article in *von Ziemssens Handbuch II*, 1, 2, Aufl., p. 154.

⁹ *Berl. Klin. Wochenschr.*, 1887.

¹⁰ I. Schmidhuisen: "Zur Casuistik der chronischen Blenorrhoe der Nasen-Kehlkopf & Luftrohrschleimhaut." *Berl. Klin. Wochenschr.*, p. 150, 1878.

¹¹ Gordon Holmes: "Chronic Catarrhal Laryngitis." *The Lancet*, November 8, 1884.

¹² David Newman: "Two lectures on Chronic Laryngitis." *The Brit. Med. Jour.*, July 4, 1885.

¹³ L. Schrötter: "Vorlesungen ueber die Krankheiten des Kehlkopfes, etc." *Wien and Leipzig*, 1892.

easily be imagined that the same process, consisting of an atrophy of the mucous membrane, degeneration of the glands and of a copious production of quickly drying secretions could even also originate first from the laryngo-tracheal mucous membrane or could be limited to it. When Schrötter, and with him, other authors speak of a degeneration of glands and increased secretion, it is a combination which I cannot understand, because the glands must be either degenerated and then they secrete less or not at all, or they secrete more and cannot be degenerated. I believe that in reality the glands secrete less than normally, that in addition the chemical combination of the secretion is so abnormally changed that it dries with exceptional readiness. Schrötter expresses his views explicitly, *i. e.*, if the conditions called laryngitis sicca or ozena laryngo-trachealis (Baginsky), are not already identical with Stoerk's blennorrhœa, they could very well correspond to the initial stage of that disease. I had read this last view of Schrötter long after having watched my two cases: at that time I had already formed my own opinion, and his views served to strengthen my belief, which belief was corroborated in an almost experimental way in the second case.

That in some of these cases there is a process similar or identical with the rhinoscleroma, I think I am justified in believing, after a case that came under my notice at the Montefiore Home. The patient, a man 27 years of age, born in Russia, came to the Montefiore Home with the outspoken symptoms of rhinoscleroma. He died suddenly a few hours after admission. The autopsy of the upper air passages was made by the house physicians, Drs. Bloch and Fränkel. I saw the specimens a few days later—the patient himself I had never seen. In the larynx there were extensive cicatricial adhesions of the mucosa and submucosa. This process affected especially the ventricles of Morgagni. But the whole appearance of the larynx differed materially from that of Stoerk's blennorrhœa. The whole surface was covered with a whitish layer, which could be easily removed. There were no crusts in the larynx. Signs of syphilis were not to be found on the cadaver. This case will be published hereafter by one of the house physicians in extenso. However, it was interesting to us to see these specimens of a disease belonging to this category.

That my second case shows at present a typical picture of Stoerk's blennorrhœa, and that Stoerk himself would not contradict the diagnosis of this case, there is hardly a doubt in my mind. The woman, coming as she does, from Galicia, completes the chain

of evidence demanded by Stoerk. But this demand of Stoerk is unnecessary and unjustly exacting, as my conviction compels me to believe that this is merely an accident. As you have heard, my first case was a native of the United States, whose parents even had never been in Austria. That furthermore, people in better circumstances can acquire this disease, Stoerk afterwards himself mentions. Of his eleven cases, one was a priest, the second a student of philosophy, and the third, a lady of "extraordinary intelligence." The case of Krakauer was a woman of Berlin. He does not mention whether she fulfilled the requirement of an uncleanly condition. The same can be said of the case of Grabower. Both of these cases make positive that Stoerk's blennorrhœa may occur in any country and under any condition, though not so frequent.

If we, in conclusion, review the most salient points in the history of our two patients, we see No. 1, whose disease reached such a high development simply because she did not seek medical advice out of fear; for had she been treated, the progress of the disease might have been checked, although not eradicated, as there are no small number of dispensaries open to the poor of New York where they can find the most skillful aid. As a proof, the patient found relief after regular treatment. Her aphonia gave way to hoarseness in a short time. Whether the improvement would have been further advanced is, of course, questionable. She left the clinic long ago.

Circumstances are different in the second case. She has really been reared amidst poverty and filth, and has been influenced so little by the social atmosphere of New York that she continues her former habits and mode of living. This still suffices to assist the disease in its progress. Notwithstanding, even in her case, there was a subjective improvement, and the hoarseness substituted aphonia, whenever she made several successive visits to the clinic.

We see, therefore, that this patient at first showed the objective symptoms of laryngitis sicca, a fact which in the discussion following my demonstration before the German Medical Society was not doubted by any of the speakers. After a few weeks, a superficial exulceration set in; later on an adhesion of the vocal cords at their anterior angle, an hyperplasia, etc., followed and the picture of the disease formerly called Stoerk's blennorrhœa was slowly formed and completed under our eyes. This case, therefore, is positive evidence that laryngitis sicca and Stoerk's blennorrhœa are one and the same disease, merely in different stages. And if you question-

me why it is one so often sees laryngitis sicca and so seldom the so-called Stork's blennorrhœa. I answer that most of the patients are not as indifferent as the poor population of Galicia, Poland, etc., and that they usually consult a physician sooner, and give us occasion to change their mode of living, and through direct local treatment, check the disease.

I have adopted the name of laryngitis sicca for this disease, following B. Fränkel's suggestion, as it covers a broader field, and I leave the name *ozena laryngo-trachealis* for those cases where *ozena* really exists, as in the nose.

And now, but a few words on the treatment of this disease, which in its latter stages becomes so hopeless. I proceeded with both patients in the following manner: First, I sprayed with a powerful spray larynx and trachea, during deep inspiration. This usually produced a coughing spell, by which some scabs were expelled. Whether I used for the spray Dobell's or a weak solution of chloride of zinc, or of tannic acid, or nitrate of silver, I confess made very little difference. The effect was the same. Following this, I put tampons dipped in Lugol's solution in both nostrils, leaving them in ten to thirty minutes. Thereafter, I sprayed again the larynx and wiped away all visible phlegm from the nasopharynx and pharynx. Internally, I gave K. I. and pilocarpine without a perceptible effect. The *fol. jaborandi* and the *fl. extr. jaborandi* seemed to act with better effect than pilocarpine.

As a final and most efficacious treatment, after cleansing the upper air passages in the above manner, I applied the massage of the throat. Over a year, I am working at this, and hope in a short time to publish elsewhere the experiences I have thus far gathered. To mention it as a part of my treatment was doing but justice to the good effect it gives.

943 Madison Avenue.

CONGENITAL OCCLUSION OF THE POSTERIOR NARES.

BY WM. SCHEPPEGRELL, A. M., M. D.,
OF NEW ORLEANS.

ASSISTANT SURGEON TO EYE, EAR, NOSE AND THROAT HOSPITAL, ETC.

AMONG the congenital deformities of the nose, none have a more important bearing on the health of the patient than the occlusion of the nares. When the occlusion is bilateral, even the life of the patient is in danger.

Although this abnormality is not referred to in many of our treatises on rhinology, still a number of cases have been described, as by Voltolini,¹ Luschka,² Cohen,³ Emmert,⁴ Bennett,⁵ and others. It is, however, fortunately a rare form of *lusus naturae*, as is demonstrated by the fact that of 12,000 cases treated in the ear, nose and throat department of the Eye, Ear, Nose and Throat Hospital of this city, no case of congenital atresia naris has yet been registered.

The *etiology* of this condition is clouded in the same darkness which obscures our knowledge of teratology generally.

Symptoms and Prognosis. In cases of unilateral occlusion of the posterior nares, symptoms, except such as refer to a certain discomfort from inability to clear the nostril of its secretions, may be entirely absent. Thus, in one case which came under my observation, the patient, a married lady of about 27 years of age, having a congenital occlusion of the left choana, complained of no ear or throat symptoms, but only of an inability to clear the nostril of mucus by blowing the nose.

In other cases, however, we find the usual symptoms resulting from nasal stenosis. In the case which I will report in this article, the patient frequently suffered from laryngitis and bronchitis, and had had, on two occasions, a purulent discharge from the ear on the affected side. The voice also had a marked nasal intonation.

¹ Voltolini: Die Anwendung der Galvano-Kaustik, Vienna, 1870.

² Luschka: Der Schlundkopf der Menschen, 1868.

³ Cohen: Diseases of the Throat and Nasal Passages, New York, 1879.

⁴ Emmert: Lehrbuch der Chirurgie, Stuttgart, 1853.

⁵ Bennett: ANNALS OF OPHTHALMOLOGY AND OTOLGY, January, 1893.

When a child is born with bilateral occlusion of the posterior nares its life is endangered unless relief can be given by operative measures. The difficulty in breathing tends to develop a pulmonary engorgement, aggravated during sleep by the suction drawing the tongue over the orifice of the larynx. The nursing is also interfered with, and unless speedily relieved, the child soon succumbs.

In a case reported by Ronaldson,⁶ the child died soon after birth from inability to breathe through the nostrils. An examination showed that the posterior nares were completely occluded by a thick membrane.

Diagnosis. The diagnosis is made by means of the nasal speculum and probe, together with the rhinoscopic mirror, or in children, with the finger inserted into the post-nasal space. The history of the case is important and will materially assist the diagnosis.

The nostril being examined by reflected light, and the mucous membrane cocaineized, a probe is passed into the nostril and if no passage can be found into the post-nasal space, then the soft palate should be cocaineized so that a palate retractor may be applied and the posterior nares carefully examined with the rhinal mirror.

In children in whom this manipulation cannot be carried out, bromide of ethyl anesthesia should be induced, and the parts carefully examined with the index finger in the naso-pharynx, and a probe passed anteriorly through the nostril.

The previous history and clinical appearance will usually allow an easy differentiation of a congenital occlusion from an acquired atresia due to lues, rhino-scleroma or the blenorrhœa of Stoerk. Robertson also reports a case of nasal occlusion following an attack of scarlet fever.

The obstruction may be due to a membranous or osseous formation, or both. The bony wall may be due to an excessive development of the pterygoid process of the sphenoid, or excessive development or a lateral curvature of the vomer towards the affected side. In the case upon which I operated, the nostril ended in a wedge-shaped funnel, the obstruction being due to a welding together of the posterior extremities of the turbinals and vomer into one bony mass.

Treatment. A membranous occlusion may be relieved by the electro-cautery, but a bony wall requires an electric or dental engine and drill, and sometimes the nasal saw. As in the stenoses

⁶ Ronaldson: *Edinburgh Medical Journal*, May, 1881.

of other canals. this condition has a tendency to recur from cicatricial contraction, which tendency is aggravated by repeated operations. The object then should be to make the opening as large as practicable at the first operation, so that after cicatricial contraction has taken place there will still be left a passage of sufficient size.

While the operation for opening the occluded choana does not appear to present any special danger, still one case of a fatal result is reported by Lange⁷ of Copenhagen. In this case the right choana of a 19-year old patient was occluded by a septum, the perforation of which was accomplished by means of the electro-cautery under chloroform anesthesia, the operation being followed by free breathing. The next day, however, meningeal symptoms developed, followed by death. No post-mortem was made, but the author supposed that the fatal result was due to a sinus thrombosis.

After operating for atresia of the anterior part of the nostrils. I have successfully used a packing of iodoform gauze, changed every second day until the healing process was completed, but the packing does not work advantageously in the posterior nares, partly on account of the difficulty of properly packing the part without danger of the gauze falling into the throat, and partly because the congestion, which follows the operation, makes it difficult to adjust the packing at the posterior part of the nostril after the first day.

Hemorrhage is usually considerable, but may be controlled by packing with iodoform gauze. Cocaine anesthesia is used, a twenty per cent solution being applied both to the anterior and posterior part of the obstruction.

The *modus operandi*, which the writer has found most practicable, will be described in the following case:

Annie M., aged 16, was referred to me on account of a complication of ear, nose and throat trouble. The patient complained of noises and pain in the right ear, and stated that she has had an "abscess" in the ear on two occasions. She coughed considerably, especially during cold changes of the weather, and easily became hoarse. She had an accumulation of mucus in the right nostril which she could not blow out, but prevented the discharge from falling out by occasionally "mopping" the nose. She had never been able to blow through this nostril since her birth.

After cocainizing the nostril, an attempt was made to pass a probe through the nostril, but was stopped at the posterior end. With the rhinoscopic mirror, the posterior opening of the left nostril appeared normal, but, on the right side, there was absolutely no opening—differing in this respect, from another case which I saw, in which there was an opening just large enough to admit a probe.

⁷Lange: *Journal of Laryngology, Rhinol. and Otol.*, Vol. VI.

To the right of the septum could be seen a slight vertical depression, indicating the line where the vomer was attached to the fused mass of turbinals, whose outline could be faintly made out.

The whole side, however, was covered with an unbroken surface of mucous membrane, and, as was learned during the progress of the operation, the obstructing wall was composed of bony tissue.

The right nostril was first cocaineized and also the posterior part of the obstruction. The pharyngeal surface of the velum palati was also cocaineized in order that a White's palate-retractor could be applied, so as to give more room to follow the operation from the post-nasal space.

A long pin, similar to a lady's hat-pin, was then passed into the nostril and through the obstruction, in order to note at what point it entered the naso-pharynx. A small opening was then drilled with a burr, operated by an electric motor, the course of the burr into the naso-pharynx being watched by means of the rhinoscopic mirror. The first opening was then enlarged by the use of successively larger burrs and the reamer, operated by the motor.



(FIG. 1.)

*Congenital Occlusion of Right Choana-Rhinoscopic Image.
The white line shows the artificial opening after operation.*

After the first opening through the obstruction was made, it was found difficult to watch the course of the operation by means of the rhinoscopic mirror, on account of the blood obscuring the mirror and the opening which had been made in the obstruction. The index finger was thereupon passed into the post-nasal space, and materially facilitated the operation. The revolving point of the drill could be felt entering the naso-pharynx, and without injury to the finger.

This procedure was also followed in another similar operation, at which I assisted, and also worked well in this case.

The drilling was continued with burrs and reamer until an opening about seven millimeters in diameter was made, which appeared to allow the passage of a sufficient quantity of air. The bottom of the opening was in a line with the upper surface of the soft palate so as to allow freer drainage from the nose.

Hemorrhage was free but not alarming, and was controlled by stopping occasionally to pack the bleeding part with iodoform gauze. The patient complained of but little pain. After the operation, the nostril was insufflated with aristol, and the posterior part packed with iodoform gauze.

The operation was apparently successful. The patient stated that she experienced great relief in breathing through this nostril, that she slept better and felt brighter.

This continued for about three weeks when the patient complained that she felt less and less air through the affected nostril, and in spite of the daily passage of sounds, the opening became gradually smaller until the nostril was again almost occluded.

A second operation was therefore decided upon. An opening about six millimeters in diameter was drilled through the lower part of the obstruction, and a similar opening through the upper part. The intervening piece of bone was then removed with the nasal saw, and the edges made even with the reamer. The hemorrhage was controlled as before, and the same after-treatment was carried out as after the first operation.

There was a certain amount of contraction in the opening, but the passage has never since closed, and is sufficiently large for breathing. Six months after the operation, the patient was reported to me to be still breathing freely through the nostril, and to have materially improved in her general health.

Medical Building.

ASEPSIS AND ANTISEPSIS IN THE NOSE AND THROAT.¹

BY JONATHAN WRIGHT, M. D.,
OF BROOKLYN, N. Y.

Mr. Chairman and Gentlemen of the Surgical Section:

After thinking over your invitation to make a few remarks on "practical and efficient cleansing of the nose, mouth and pharynx prior to operations thereon," I came to the conclusion that you had made a mistake in choosing me, as I do not know how to cleanse the nose in a surgically aseptic sense. You have informed me, however, that it is not meant in that sense. Miller, Park, and many others have described the large number of pyogenic bacteria in normal throats.

^{1,2} It has been shown by Besser, Delletti, myself, and others, that even the normal nose, in the majority of cases, is the site of more or less numerous agents of suppuration, the staphylococcus pyogenes. If you will make cross and vertical sections of the nasal cavities in the cadaver, you will at once see the entire impossibility of disinfecting the anfractuositities, the depressions, and projections of the mucous membrane of the cavities themselves, and still more of the accessory cavities, the maxillary, the ethmoid, sphenoid, and frontal sinuses, all of which communicate with the nose proper, and all of which bacteria may be found. The naso pharynx also is an especially favorite breeding-place of infective bacteria. I have found there the streptococcus erysipelatosus in an apparently normal case, and produced phlegmonous erysipelas with the cultures in rabbits.

"Were it not to be presumed that the intra-nasal tissues possess or acquire considerable power of resistance to the entrance of infective agents, or of neutralizing their baneful properties, it would be hard to understand why cases of septicemia are not of frequent instead of rare occurrence after intra-nasal operations. Another clinical phenomenon has attracted my attention in this

¹ Read by invitation before the Surgical Section of the New York Academy of Medicine, April 9, 1894.

² Nasal Douches and Sprays—*Medical Record*, January 14, 1893.

connection, and that is the comparative harmlessness of surgical procedures when the site of operation is below a region of suppuration, as in antrum or ethmoidal trouble. Pus continually flows down over the wounded septum or turbinated bone, yet with very imperfect cleansing it is rare that any local or constitutional evidence of septic trouble supervene. Indeed, I have almost persuaded myself that there is less apt to be a rise of temperature in these cases than where there is no previously existing suppuration."

Remembering these bacteriological and clinical facts, the question naturally arises. "why should we cleanse the nose and throat prior to an operation?"

Lermoyez and Wurz have lately, in a very elaborate paper,³ stated, and they reinforce their statements by numerous apparently faultless experiments, that the nasal cavities are not only sterile, but that the nasal mucus is a germicide annihilating anthrax spores when mixed with broth containing them. Accepting these statements as trustworthy it would seem a waste of time, and bichloride to cleanse the nose prior to an operation.

Disregarding this latest and possibly not most reliable announcement in regard to nasal bacteriology until we have confirmation of it, we must start with the understanding that the nose and mouth and throat are lurking places not only of pyogenic bacteria, but also occasionally of the pneumococcus and Löffler's bacillus. We are not in a position as yet even to conjecture what the protective influence against them is. We cannot believe it is only the general protection now supposed to reside in the albumoses of the blood and other tissues. Sepsis is the least of the dangers we fear in tonsillotomy, nasal spur operations, or those for post nasal lymphoid growths. As general surgeons, you are better able to judge what the result would be in many cases when operations elsewhere in the body are done in such an infected area. It seems reasonable to suppose that there is some local protection residing in the immediate vicinity of the mucous membrane itself, since this immunity from sepsis I believe does not hold so true for wounds deeper into the tissues.

However as prudent operators, we should conform as far as practical with the general consensus of modern surgical opinion.

To cleanse the nose, a coarse spray of Dobel or other alkaline antiseptic solution from a compressed air apparatus should be used anteriorly.

³"Le Pouvoir Bactericide du Mucus Nasal." *Annales des Maladies de l'oreille et du Larynx*, August, 1893.

The ordinary hand atomizers are valueless. Follow this immediately by the use of the post-nasal syringe, using several syringefulls of the same solution warmed so that the nasal chambers are thoroughly flooded from behind. This is much more efficient than the anterior spray.

The same procedure may be used to cleanse the naso-pharynx. For the mouth and oro-pharynx, spray them out thoroughly with peroxide of hydrogen solution about 1-3. Let the patient follow this up by rinsing his mouth out and gargling with a 1-5000 sol. of bichloride.

What we have done here is not to render the area aseptic. We have simply somewhat diminished the number of germs on the surface. Dr. Park has shown this bacteriologically for the mouth and pharynx. As for myself, in the nose, I place a good deal more reliance upon irrigation after the operation than upon preliminary cleansing, and I think this a matter of some importance because drainage in the nose is imperfect, and secretion gathers at the seat of operation. In the ordinary operations on the naso-pharynx and pharynx, I think neither preliminary cleansing nor subsequent irrigation influences the result as drainage is free. There is not the slightest doubt but that bacteria are absorbed at the site of the wound. Irrigation diminishes the dose of organisms absorbed, but nature herself does the *efficient* antiseptic work. Where there is external dressing, irrigation of the nose after operation may not be practicable, but I should be disposed to depend upon that rather than upon the preliminary cleansing for my antiseptis. Asepsis is out of the question. The same, to a less extent, is true of the mouth.

73 Remsen Street.

ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY

*A QUARTERLY JOURNAL OF PRACTICAL OPHTHALMOLOGY,
OTOLOGY, RHINOLOGY AND LARYNGOLOGY.*

EDITED BY

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SAINT LOUIS, MISSOURI.

Subscription Price, Including Postage in North America:

PER ANNUM, IN ADVANCE,	\$4.00
SINGLE COPIES,	1.25

SAINT LOUIS, MISSOURI:

VOL. III.	APRIL, 1894.	No. 2.
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CLINICAL MEMORANDA.

SECONDARY HEMORRHAGES FOLLOWING
CATARACT EXTRACTION.

BY WALTER R. PARKER, M. D.
OF DETROIT, MICH.

LATE HOUSE SURGEON, WILLS' EYE HOSPITAL, PHILADELPHIA.

FOR the privilege of reporting the following cases I am indebted to Dr. Hall. Dr. Goodman and Dr. Oliver, attending surgeons to Wills' Eye Hospital, Philadelphia.

Dan'l B., aged 64. January 5, 1893, lens extracted with loop after an iridectomy had been done. Vitreous semi-fluid, small amount escaping. There was a profuse hemorrhage, the coloboma and papillary space remaining full of blood. Atropia instilled, and ordinary antiseptic dressing applied.

January 6, wound closed; blood absorbing.

January 7, fresh hemorrhage, whole anterior chamber filled with blood.

January 9, blood rapidly absorbing; some iritis; atropia continued.

January 20, no trace of blood; conjunctiva clear; iritis gone; marked secondary present.

March 14, capsulotomy done.

March 21, V. w. S. + 11 = C. + 2 ax. $150^{\circ} = \frac{20}{00}$.

Geo. R., aged 63. March 14, lens extracted with iridectomy, followed by large prolapse and loss of vitreous, caused by patient squeezing. Protruding vitreous excised; eye closed.

March 15, wound closed; reaction slight.

March 17, a. m., eye quiet; patient allowed out of bed; p. m., large hemorrhage in anterior chamber; no pain; no history of injury. A pressure bandage was put on after instillation of atropia, and patient put to bed.

March 18, blood absorbing.

March 19, fresh hemorrhage filling anterior chamber; leech, atropia, and bandage.

March 21, blood nearly gone; eye quiet.

March 24, no trace of blood; vitreous opacities.

March 25, slight hemorrhage.

March 28, eye clearing.

No trouble followed, final V. w. S. + 11 = $\frac{70}{100}$.

Jacob G., aged 72. September 18, simple extraction done without accident. While washing eye, patient squeezed, causing prolapse of iris and vitreous. Iridectomy done through prolapsed vitreous, and vitreous cut away. Coloboma filled with blood; eye closed.

September 20, wound open; coloboma and pupillary space filled with blood.

September 22, anterior chamber formed; blood absorbing.

September 23, blood nearly gone.

September 24, fresh hemorrhage one-third filling anterior chamber; leech, atropia, bandage.

September 26, blood nearly gone.

October 2, large hemorrhage from behind iris bulging a portion of the iris forward, and nearly filling coloboma and pupillary space.

October 4, blood almost gone; vitreous opacities; V. = light.

October 11, bulging of iris almost gone; V. = $\frac{3}{00}$.

October 20, small hemorrhage from behind iris, up and out.

November 8, no trace of blood in anterior chamber; vitreous opacities; V. w. correction = $\frac{20}{00}$.

In the first two cases no note was made of general condition. In the third case age was well borne generally, the radials were distinctly beaded and second aortic sound accentuated. No valvular lesions were found.

32 Adams Avenue West.

A NOTE OF PROGRESS IN THE METHOD OF MEASURING AND DESIGNATING PRISMS IN OPHTHALMIC PRACTICE.

BY SWAN M. BURNETT, M. D., PH. D.,
OF WASHINGTON, D. C.

SINCE Dr. E. Jackson first proposed a reform in the numbering of prisms by the minimum deviation power at the Ninth International Medical Congress in Washington in 1887, there has been a pretty full discussion of the subject in the various aspects in this country, and while there has been no general expression of unity among the profession as to a preference for any one particular method of designating prisms it would be safe to say that the majority of those who have given the reform any serious consideration have adopted the method of expressing their power by their deflection in centimeters on a plane at a meter's distance. This is the system first proposed by Mr. Prentice in 1890, and was adopted by the Ophthalmological Section of the American Medical Association in 1891. The unit of this system is a prism causing a deflection of 1 centimeter on the meter plane and is called a prism-diopter. (P. D.); a prism giving a deflection of 2 centimeters at the meter plane is 2 P. D., etc. The centrad system which was proposed by Dr. Dennett, and adopted by the Amer. Oph. Soc. in 1889 has been so modified by its advocates that it does not differ in its essential principles from the prism diopter, and now for the prisms which are in common use in ophthalmology these two systems, which are the only strictly scientific and available ones that have been proposed, are for all practical purposes the same. So it may be said, in a general way, that in whatever manner prisms may be designated, whether by degrees, centrads, prism-diopters, if they are measured at all, they are measured on the basis of the unit of a centimeter's deflection on a plane at a meter's distance. It happens, fortunately, that this method falls in close approximation with the old method of numbering in degrees, since a prism of 1 P. D. has about the same power as a prism marked 1° in the old style, and so the machinery which has been in use in the manufacture of prisms need not be changed, and most of the prisms now in stock can be used in the new system of numbering. The introduction of the reform has, therefore, been comparatively easy since it required no revolution anywhere, and for its carrying

out on the part of the practitioner there is required only a meter measure and a centimeter rule, though the charts which have been offered, first by Prentice and afterwards by Ziegler, Herbert and others, have, of course, many desirable practical conveniences.

It is not our purpose to again go over the numerous advantages both scientific and practical which this method offers; these will be found duly set forth in Mr. Prentice's various papers as well as my own and others who have written on the subject.¹

The object of this short communication is to call attention to the fact that the advantages of the system have also been fully recognized by the manufacturing optician, and that now the trade is supplied with prisms ground to exactness, while the strength of each prism corresponds accurately with its number expressed in prism-diopters. The American Optical Co., of Southbridge, Mass., one of the largest manufacturing optical firms in this country, have just issued a catalogue in which they announce that all the prisms in their trial cases, and for use in the trade are ground to the prism-diopter system. They have also adopted as a mark of designation the prismatic figure (Δ) which is the Greek letter delta, and which very appropriately symbolizes the prism-diopter as was indicated by Mr. Prentice in one of his early papers: thus 3Δ means 3 P. D., etc. This sign has this advantage among others, that it is not likely to be confounded with the sign of the degrees ($^{\circ}$) indicating the axis of the cylinder in astigmatism, for instance. I have also information from the Geneva Optical Co., of Rochester, N. Y., the other largest manufacturing optical company in this country, that they too are prepared to furnish prisms in accordance with the prism-diopter system when so requested, and they will undoubtedly soon place them in the general market. It is thus seen that the dioptral system is now as firmly and securely fixed as regards prisms as it has been for a number of years in regard to lenses, and both are correlated, as they should be, under the universally accepted metric system, in a manner which is scientific, convenient of application, and easy of comprehension.

¹C. F. Prentice: A metric system of numbering and measuring prisms. *Archives of Oph.*, Nos. 1, 2 and 3, 1890. A prismometric scale. *Amer. Jour. of Oph.*, Oct., 1891. Le mémorotage et la mesure des prismes. *Annals d'Oculistique*, 1892. Dr. E. Jackson's article in *Oph. Review*, June, 1890. Dr. B. A. Randall, article in *Med. News*, April 4, 1891. The reformed numeration of prisms and the centrad as a unit. *Trans. Amer. Med. Ass'n.*, 1891. Swan M. Burnett, the metric system in numbering prisms. *Oph. Review*, Jan., 1891. (Also introduction to Mr. Prentice's first paper in the *Archives of Ophthalmology*, 1890). The prism-dioptre vs. the centrad. *Trans. Amer. Med. Ass'n.*, 1891. On the reform in numbering prisms, *Med. News*, May 2, 1891. A metric system for numbering prisms with a description of an instrument for measuring their deviating power. *Trans. Internat. Med. Congress*, 1890.

REPORT ON PROGRESS—OPHTHALMOLOGY

REVIEW OF CURRENT AMERICAN AND ENGLISH
OPHTHALMIC LITERATURE.

BY CHARLES H. MAY, M. D.,

OF NEW YORK.

THE EYE TREATMENT OF EPILEPTICS.

Ambrose L. Ranney, A. M., M. D., (*The New York Medical Journal*, January 13, 20, and 17, and February 17, 1894). The greater part of this lengthy article is occupied by the histories of cases. The author has selected twenty-five cases which "indicate what to his mind would be about the average results of his personal examinations and treatment of a large number of epileptics during the past ten years." *All but four cases had errors of refraction: every case showed heterophoria.* Treatment by drugs was dispensed with and eye treatment alone made use of: glasses correcting the errors of refraction were prescribed. (not, however, in every case). and tenotomies were performed for the relief of the heterophoria. The results were the following: Ten cases had no attacks for four, five, six, seven, nine and eleven months, one, two, two and one-half, and seven years: two cases had one attack each in eight and sixteen months: two cases one each in three years: four cases resulted negatively. (no improvement): three cases had from three to six attacks in periods varying from eight to eighteen months: four cases are reported as "somewhat less," "attacks less than before," "reduced in number," "no convulsion in four months: attacks of petitmal much less frequent."

Although Dr. Ranney explains as his reasons for not giving all the cases which had been subjected to eye treatment exclusively, that "the number would be too large to admit of their complete histories, and the labor of preparing their records for publication would be too great," and says "I admit that any deductions regarding the eye tests in epileptic subjects derived from twenty-five cases can not be regarded as final," he has given certain conclusions: we must therefore regard these as based, not entirely upon the cases which he recites in this paper, but rather upon his experience in general.

It is a pity that such an opportunity for a valuable contribution to the much-discussed question of the status of heterophoria in the production of various nervous disorders has been lost: that there is

such a relationship no one can deny: how much it amounts to or how often it is encountered, is still a question. Had the writer taken hundreds of cases, even though he had been compelled to limit himself to the report of the examination of the refraction and of the condition of the muscles, the treatment by glasses and tenotomies and the results after a year or two, a very good paper would have resulted, valuable both scientifically and practically.

Dr. Ranney reviews Mr. Dodd's very instructive report concerning the refractive conditions of epileptics, as follows:

"At a late meeting of the Ophthalmological Society of the United Kingdom, a report of the refractive conditions of epileptics was made by Dr. Dodd, (based upon the examinations of a hundred epileptic subjects as contrasted with similar tests upon fifty healthy persons). The effects of treatment by a correction of the refraction alone by glasses were also reported.

"Out of one hundred epileptic subjects, seventy-five were found to require glasses, and were directed to wear them. Only fifty-two of these patients were faithful in obeying instructions. Of these fifty-two, thirteen had no attacks for an interval of from one to two months, thirty-six were more or less benefitted, and three were not apparently influenced by the correction of the refraction.

"The conclusions drawn by Mr. Dodd were: 1. That errors of refraction may excite epileptic seizures. 2. That the correction of the refraction is of value in the treatment of epilepsy. 3. That other sources of irritation may be suspected when a correction of refraction fails to afford marked relief.

"To any one familiar with the later methods of investigation and treatment of heterophoria, the investigations of Mr. Dodd must seem singularly incomplete. Yet it is interesting to note that the correction of refraction alone accomplished enough in cases of chronic epilepsy to warrant a verdict in favor of eye treatment."

Dr. Ranney does not report Mr. Dodd's results correctly. In both *The Lancet* and the *British Medical Journal* reports of the meeting of the Ophthalmological Society of the United Kingdom at which Mr. Dodd presented his paper, it is stated that the length of time during which *these thirteen cases were free from attacks was from four months to one year*. This would make a much better showing and would make Mr. Dodd's results from the simple correction of errors of refraction in seventy-five *unselected* cases almost, if not quite as good as those obtained by Dr. Ranney by frequent tenotomies, in his twenty-five *selected* cases.

Had Dr. Ranney followed Mr. Dodd's style in reporting his cases, adding the results of his examinations of the condition of the muscles and the treatment of heterophoria, his paper would have been a very useful one. He has, as was to be expected, laid particular stress upon heterophoria and tenotomies for its relief. In

a number of cases in which hypermetropia existed, this error of refraction was ignored in the treatment; at least, he has failed to record any such correction.

The histories of cases include much that is irrelevant—scientifically considered; thus the following lines representing extracts from the histories of cases will allow the reader to judge:

“A most pathetic scene occurred at the depot on the arrival of this boy, his mother becoming hysterical over what she termed “his resurrection to health and mind.” (Case 2).

“In fact it (his mental condition), had become so alarming that his father, with tears in his eyes, said, “that although he was his only son, he would rather see him dead than in his present position.” (Case 5).

“I want to tell you how very grateful I feel for the great good you have done my boy. It is really wonderful how he has improved in health since he has been under your care. * * * This seems almost a miracle when you remember how the boy suffered before coming to you.” (Case 6).

“It has occurred to me that you may have considered that ingratitude has been shown by a failure on my part to indicate how much my dear sister has improved,” etc. (Case 9).

Such extracts from letters of grateful patients may have their uses, but they should certainly not have space in scientific papers published in medical journals, to the exclusion of more instructive matter.

In one part of his paper, he says concerning orthophoria: “I regard this as an extremely rare condition in epileptics.” If, instead of all this irrelevant sentimental matter, Dr. Ranney had reported how many of all the cases treated during the past few years had normal adjustment of the ocular muscles, and then by way of comparison, how often orthophoria occurred in individuals who enjoy perfect health, he would have enhanced the value of his paper by definite scientific data, which would have tended to accomplish something in the solution of this disputed question.

His conclusions are based upon general experience, and not, strictly speaking, upon the twenty-five cases reported; they embody many truths and many statements which every oculist will agree to and consider good, but also some which are too extreme to be generally accepted. The paper may be of value in encouraging investigation in what may be, and probably is, a fruitful field.

SUBCONJUNCTIVAL HEMORRHAGE LIMITED TO THE OUTER PART OF THE EYE: A SIGN OF FRACTURE THROUGH THE CORRESPONDING ORBITAL PLATE.

Rutherford Morison, M. B., F. R. C. S., (*The Lancet*, January 6, 1894). The article contains illustrations from two patients—roughly fan-shaped hemorrhage in the outer part of the eyeball.

This symptom, following injury to the fore part of the skull, the writer believes to be a frequent condition associated in the great majority of instances, with a fracture through the orbital plate corresponding to the eye affected. Three cases in which he had the opportunity of making post-mortem examinations after noting the presence of this sign during life, served to convince him that it is of considerable importance. He does not consider the shape of the hemorrhage due to pressure of the lids nor limited by the sheath of the external rectus. "A satisfactory explanation of why the hemorrhage is limited to this region is difficult. The presence of a quantity of loose cellular tissue in the outer part of the orbit, and the fact that there is more room here than elsewhere, may account for a small hemorrhage showing itself in this specific position, the shape in the later stages being largely determined by the pressure of the lids."

[While the above may apply to such hemorrhages following injuries to the skull, fan-shaped subconjunctival extravasations of blood occur quite frequently over the outer portion of the eyeball without any history of traumatism, sometimes as the result of a fit or coughing, at other times without any cause. C. H. M.]

SUBVOLUTION, A NEW PTERYGIUM OPERATION.

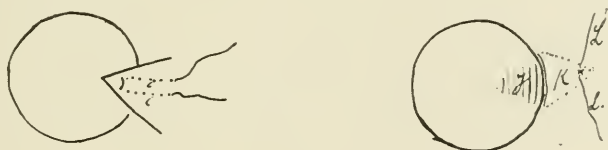
Boerne Bettman, M. D., Chicago, (*Chicago Medical Recorder*, January, 1894, and *Journal of the American Medical Association*, March 24, 1894).

In this article, the writer reviews the many theories which have been advanced to explain the origin and mode of growth of pterygium and the numerous methods of operation for its successful removal. Concerning the theories of pathology, he mentions the views of Arlt (micrococci). Theobald (muscular). Mannhardt (episcleritis). Fuchs (pinguecula). Then he describes the different operations: Excision (Cocius, Arlt), evulsion (Wright, Prince), transplantation (Desmarres, Knapp), strangulation (Szokalski, Galezowski), transplantation of a Thiersch's graft (Hotz).

He believes that most of these procedures, aiming either at destruction of tissues or at growth in a new direction, are frequently followed by a return of the growth: "none of the authors taking into consideration the salient features involved in all plastic operations of the conjunctiva, namely, the prevention of contact between two raw surfaces" * * * "this accounts for the relapses which so frequently occur." The method which he has practiced during

the past six years prevents readhesion by turning the external surface of the triangular flap containing the pterygium underneath: to this method he has given the name "*subvolutio*." He performs the operation in the following manner:

"The pterygium is gathered up by the two branches of a fine forceps serrated at the ends. A knife is passed underneath it close to the cornea, and the triangular membrane is dissected off towards the apex. A suture with a needle at each end is passed through the apex. Both needles are inserted from above downward, thus leaving a loop of thread on its outer surface. The needles are now passed through the base from below outward. The points of puncture being the ends of parallel lines drawn from the punctures in the apex, and just far enough back so that the flap is turned upon itself underneath the base, the roll will correspond with the sclero-corneal margin. The ends of the suture are now firmly tied. We have induced a condition similar to gumming the flap of an envelope to its body. The under surface of the pterygium is brought in contact almost throughout its entire extent, and adheres. A readhesion to the cornea is prevented by the roll of mucous membrane at the sclero-corneal margin."



The operation is similar to Galezowski's, though the principle involved is different, since the writer's method does not aim at destruction. The folding produces a temporary unsightly thickening, disappearing in a few days: this folding adheres to the sclera, and the raw surface of the cornea is covered with scar tissue and regenerated epithelium.

"No matter how much the base of the pterygium contracts after dissection from the cornea, sufficient allowance can always be made by stitching the apex more or less forward. The apex may be cut off, or not, depending entirely upon the degree of thickness. The operation is especially indicated in large pterygia. Even in smaller ones, where the growth contracts considerably after having been separated from the cornea, it is followed often by good results. In these cases adhesions will form, which will draw the turned flap over the sclero-corneal margin."

THE RELATION OF OPHTHALMOSCOPIC FINDINGS TO DISEASES
OF THE CEREBRAL CORTEX AS ILLUSTRATED BY A SERIES
OF OBSERVATIONS UPON NEARLY TWO HUNDRED
CASES OF EPILEPSY AND GENERAL PARALYSIS
OF THE INSANE.

Charles A. Oliver, A. M., M. D., Philadelphia, (*University Medical Magazine*, March, 1894). "This paper," the author states, "resolves itself into a series of broad general formulations and conclusions that are the outcome of seven years' ophthalmic work among the male epileptic and parietic subjects in the State Hospital for the Insane at Morristown, Pennsylvania."

The following are among the *observations*:

"1. The ophthalmoscopic findings of the living intra-ocular tissues, especially those of optic-nerve and retinal structure, in cases of epilepsy of sufficient moment and standing, (as seen in the detained subjects of asylum life), to give numerous well-pronounced and uncontrollable seizures, are often of such a grade and of such a character as to constitute a type.

"2. The objective peculiarities of such living tissues, as seen in all grades of condition under the magnifying power employed in the direct method of ophthalmoscopy, are characterized by the appearance of a low and chronic form of retinitis and perivasculitis that is associated with a dirty red-grey incipient degeneration of the optic nerve.

"3. The ophthalmoscopic findings of the living intra-ocular tissues, especially those of optic-nerve and retinal structure, in cases of so-called general paralysis of the insane are so certain and so persistent in characteristic appearances, and are so increased in amount and degree in proportion as the general disease assumes its latent phases of retrogradation of the subject, that they become eminently characteristic of the type of the affection, and assume a definite expression of the stage of the disorder.

Observation four gives the principal retinal and optic-nerve changes which are found more pronounced in the third stage of the disorder, where they may be frequently recognized in their incipency.

"5. The microscopic findings in the cerebral cortex in most cases of epilepsy where there have been long-standing, frequent and general seizures, consist principally in degeneration changes in the nerve-cells, especially of the second layer and in a secondary increase and tortuosity of the vessels themselves, with nuclear infiltration in the air walls.

"6. The microscopic findings of the cerebral cortex in cases of so-called general paralysis of the insane consist of degeneration changes in the nerve-cells, and increase of the vessels with thickening and infiltration of the vessel-walls.

"7. A careful analysis of the above definite ophthalmoscopic findings with the correspondingly known and recognized microscopic changes in the cerebral cortex in the two diseases, not only shows a correspondence in the types of the pathological conditions of the vascular and neural structures of the two membranes in question, but evidences an absolute co-relationship as to degree and amount of tissue-change, though, of course, not as to kind, in the several stages in the two diseases.

"The conclusion, therefore, from these observations, naturally resolves itself into the fact that the morbid process of the cortex disease, as seen under the microscope, if long-continued and if of any moment, can be recognized ante-mortem ophthalmoscopically in the optic-nerve-head and retina by similar relative changes of diseased action in these latter tissues."

TWO CASES OF SARCOMA OF THE LACHRYMAL GLAND.

J. R. Lawford and E. Treacher Collins, (*Royal London Ophthalmic Hospital Reports*, Vol. XIII, December, 1893).

"These two cases seem worthy of record as examples of a somewhat rare disease. The first case presented considerable difficulty in diagnosis: the short history and the physical signs led all those who saw the patient to suspect the existence of some inflammatory condition of the orbit, *e. g.*, abscess, suppurating cyst, etc. The second case was less puzzling, but in the early stage was thought to be most probably a periosteal or bone lesion. It seemed doubtful at first if the tumor could be wholly removed without sacrificing or damaging the eyeball, but in each case this was accomplished, although not without considerable difficulty.

"In every case of sarcomatous growth involving the lachrymal gland, there is room for doubt as to whether the growth originated in the gland or spread to it from surrounding structures. In our two cases, the situation of the new growth between the gland tubules, which were separated by it, inclined us to think that the fibrous stroma of the gland was the starting point of the sarcoma. The clinical evidence also favors this view."

ACUTE CEREBRAL AMAUROSIS OF INFANCY.

William Gay, M. D., (Edin.). M. R. C. P., (London). (*Royal London Ophthalmic Hospital Reports*, Vol. XIII, December, 1893).

Dr. Gay reports seven cases of this condition which were observed at Moorfields and Great Ormond Street, Children's Hospital.

“Optic neuritis is a well-recognized symptom of meningitis, and in some of the cases which end in recovery a greater or less degree of blindness is found to result either from that or secondary atrophy. In certain cases, however, absolute blindness is discovered when the meningitic symptoms are beginning to clear up, and no ophthalmoscopic changes at all can be found to account for it. The pupils may be slightly unequal, dilated, or sluggish in the response to exposure to light, but sometimes they appear perfectly normal. The blindness persists for some weeks or months, after which sight, as a rule, is gradually restored; but occasionally one or both discs become atrophic, and recovery either takes place to a very limited extent or permanent blindness is established. Such a condition of amaurosis, unaccompanied by any visible changes in the fundus, is sometimes found after basic meningitis with cervical opisthotonos, and also after simple meningitis resulting from caries of the petrous bone, or following an exanthematous disorder. Sometimes, also, it follows an attack of which the status convulsivus is the most prominent symptom; and Nettleship, who was the first, I believe, to draw attention to this form of amaurosis, describes a case in which the symptoms were apparently those of thrombosis of the veins over the Rolandic area.”

A CONTRIBUTION TO THE ANATOMY OF THE HUMAN RETINA
WITH A SPECIAL CONSIDERATION OF THE TERMINAL
LOOPS OF THE RODS AND CONES.

W. F. Norris, M. D., and James Wallace, M. D., Philadelphia,
(*University Medical Magazine*, March, 1894).

The authors point out the difficulties of studying the anatomy of the rods and cones of the human retina; hence anatomists have often been obliged to resort to the eyes of the lower animals, (fishes, frogs, birds, and some mammals). The retina of an eye removed for a wound would offer the nearest approach to a normal retina, and such an eye was used for the purposes of this contribution. Drs. Norris and Wallace mention Henle, Heinrich, Mueller, Max Schultze, and Hannover as the prominent writers in this field, and review their findings. Continuing, they say:

“Our illustrations show that the cones terminate in a looped extremity which passes down over the body of the cone, and after some convolutions in the position of the so-called external limiting

membrane passes along among the elements of the outer nuclear layer. Our preparations show a marked difference in the length of the cones, some of them forming loops much nearer to the external limiting membrane than do others. A fine longitudinal striation has been observed by many investigators on the bodies of the cones, and the necks of the cones have been seen in the eyes of fishes to possess a series of transverse markings which presumable was due to their structure being composed of disk-like bodies. In our original photo-micrographs these delicate lines are plainly visible. The longitudinal markings can be traced from nearly the bases of the cones and are seen to undergo a twisting, which on the necks of the cones, produces the transverse striations which have previously been described in the eyes of fishes. As the neck recurves and passes down over the body of the cone as a fiber, we can see a portion of the cone over which it passes transversely striated in some places. We thus have transverse and longitudinal markings side by side. The transverse striations do not end in the layer of cones, but are plainly visible among the fibers of the outer nuclear layer. They may be followed into the optic nerve by this characteristic spiral wrapping. In the internal granular layer, the investment of the fibers with this covering seems to be reinforced, while other fibers passing at right angles form an arrangement resembling wicker-work. In the layer of optic nerve-fibers a similar arrangement may be observed."

ABSTRACTS FROM FOREIGN OPHTHALMIC JOURNALS.

By CASEY A. WOOD, C. M., M. D.

PROFESSOR OF OPHTHALMOLOGY, CHICAGO POST GRADUATE MEDICAL
SCHOOL; OCULIST AND AURIST TO COOK COUNTY AND THE
ALEXIAN HOSPITALS; ETC.

CATGUT SUTURE IN EXTENSIVE WOUNDS OF THE OCULAR TUNICS.

A very practical paper is Beccaria's¹ account of a case where suture of the conjunctiva and sclera was resorted to with good results in an extensive bulbar wound. After referring to the efforts made in this direction since Pomeroy's first attempt in 1865, and quoting largely from the literature of the subject, he relates the following history:

"C. A., aged 19, was injured on the morning of January 24, with a piece of a glass bottle, so thrown that it cut from before backward and from above downward the left eye and upper lid. He came to the clinic the next day and presented the following appearance: 1. Coloboma of left upper lid about 14 mm. in length, involving all the palpebral tissues and reaching the ciliary margin. 2. Wound of the conjunctiva and sclera stretching from the limbus 16 to 17 mm. 3. Coloboma of the iris, above and out. This portion of the iris appears pushed into the wound, and is probably the origin of the hyphoema that completely fills the anterior chamber and makes it impossible to say whether the lens is injured or not.

"Lying across the wound is a small blood-clot; there is no escape of vitreous. Tension is — 2; perception of light good. On the same day that the patient was admitted to the clinic three silk sutures were put into the palpebral wound. On the following day the conjunctiva and sclera were similarly treated with four catgut stitches. The tension of the eye continued to be minus; no traces of catarrh or infection of the conjunctiva; persistent hyphoema involving the whole of the anterior chamber; perception of light still good; a protective and antiseptic bandage, not compress, applied.

"Six days afterwards the palpebral sutures were removed, and the wound was found to be fully cicatrized. Patient remained twenty-two days in the hospital, and at the end of that time the sclero-conjunctival wound had entirely healed. The tension became normal very early; the hyphoema gradually disappeared (except a minute coagulum that persisted for some days on the central portion of the anterior capsule), revealing an entirely opaque crystalline.

¹ F. Beccaria: *Considerazioni sopra un caso di estesa ferita della congiuntiva e della sclerotica. Annali di Ottalmologia, Anno XXII, 1.*

"There remained also a slight ptosis, a linear cicatrix of the upper lid, a linear, smooth, and regular scar of conjunctiva and sclera which showed no tendency to retract, and an upward and outward coloboma of the iris. Pupil reacts to light; lens slightly absorbed below where the pupillary area is black, and seems partly filled with minute lenticular fragments. The blood-clot, previously referred to, finally disappeared. Projection good.

"At the end of October the scleral scar is still smooth; three-fourths of the crystalline is absorbed. Vision with $+ 11.0$ D. $= \frac{1}{5}$, and with $+ 18$. patient could read No. 5, de Wecker, at 20 centimeters. He had no appreciable astigmatism. The vision of sound eye is normal. On account of pieces of capsule and lens detritus occupying the pupillary area, the writer could not get a satisfactory view of the fundus."

"The patient refused to permit a discission, although it would doubtless improve his vision."

In the foregoing case, Bacceria followed the plan of Galezowski who passes the stitches through both sclera and choroid, thereby acquiring a firm hold upon the edges of the wound. The author lays down six rules for guidance in dealing with such serious wounds of the sclerotic: 1. Bring together the lips of the wound by stitches. 2. Use catgut. 3. Introduce as small sutures as possible, and, in entering them, carefully avoid dragging upon the bulbar membranes. 4. Practice a vigorous antiseptis. 5. Apply a protective bandage, not compress. 6. For several days enjoin absolute rest upon the patient.

PROPHYLAXIS IN CATARACT OPERATION.

Panas² reminds his readers that he recommended some years ago that a solution of biniodide of mercury should be injected into the anterior chamber with germicidal intent. This, he continues, has been followed by the use of warm boric acid with good effect. There still remains, however, a certain percentage of cataract extractions that, in spite of these irrigations and other aseptic precautions, do not escape infection. This is largely due to the fact that in a perfectly normal eye, with ideal cilia, lids and lachrymal apparatus, the staphylococcus albus and aureus can, alone and commingled, be found on every trial, and from cultures of these the cornea of rabbits can be inoculated and infective ulcers produced.

In a series of cases where the sac and lids had been well washed with the aqueous solution of mercuric iodide, cultures, although not such active ones, could still be grown from microbes gathered in these regions.

² Panas: *Prophylaxie des accidents infectieux consécutifs à l'opération de la cataracte. Archives d'Ophthalmologie*, Oct., 1893.

In a third series, in addition to irrigation with the watery solution of iodide, *the free borders of the lids were anointed with an oily solution of the biniodide*, and a bandage applied until the following day. Of seven cultures then made, two were negative and five showed traces of the growths. Of the rabbit's cornea inoculated with the latter, four results were negative, and one only gave rise to a small circumscribed corneal abscess.

Experiments with growing colonies showed that a small quantity of the oil entirely stopped their growth.

Panas has, for several months past, in consequence of these experiments, been in the habit (as a preliminary to cataract extraction), of first washing out the eye with a solution of the biniodide, then brushing over the free borders of the lids with "biniodide oil," (4 to 1,000), after washing them with a solution of sodic carbonate. This is done the evening before the operation, and as a further precaution, a protective dressing is applied and left on until the moment of the operation. Since putting this plan into operation, 170 cases have been operated upon without the least local complication, whatever may have been the state of their general health.

ON THE TREATMENT OF CERTAIN EYE DISEASES BY
SUBCONJUNCTIVAL INJECTIONS.

As the subconjunctival treatment, (Darier's method), of ocular diseases, and especially of deepseated changes within the eye is just now attracting some attention at home and abroad I have abstracted a very practical paper by Gepner³ Jr., of Warsaw, on the use, in this manner, of mercuric chloride.

The indications for the employment of sublimate solutions are chiefly those of a *local* antiseptic, viz: in all acute inflammations of the cornea and iris, as well as in those cases where the general effects of mercury are also desired. A small (Pravaz) hypodermic syringe is used, preferably with a needle flattened at its point and made of platinum so that it can be sterilized in the flame. He uses the original Darier formula and injects at each sitting $\frac{1}{10}$ mg. or 0.0004 grm. of corrosive sublimate in solution.

Cocaine is first used and then the syringe point is entered about 1 cm. from the sclero-corneal junction and run about 1 cm. under the connective tissue. A bandage is then applied, to be removed on the following day.

³B. R. Gepner, Jr.: *Ueber subconjunctivale Sublimat-Einspritzungen. Centralb. für prakt. Augenheilkunde*, Jan., 1894, 1.

Immediately after the injection the pain is quite severe and may last for hours, but finally the sensation is that of a foreign body in the eye. If a bloodvessel be injured, a subconjunctival bleeding results, which is slowly reabsorbed. On the day following the injection the eye becomes red, the connective tissue swollen, and at the point of entrance there are numerous minute hemorrhages. On the second to fourth day the eye is again quiet, and the injection may be repeated.

Care should be observed not to enter the syringe point twice at the same spot as this procedure sets up an adhesive inflammation between conjunctiva and Tenon's capsule, leaving a blue-white nodule difficult of penetration by the point of the syringe and very painful. With this exception, no further complication has arisen.

As to the number of injections, the writer takes the results obtained as his guides in acute cases; in chronic diseases the treatment must last much longer. If two or three injections produce no results, it is useless to continue them. In severe cases, especially in those of luetic origin, additional subcutaneous injections are valuable.

In the *cornea* where microbic influences are often at work the author thinks the injections are of special benefit. He gives a number of illustrative cases:

1. *A central corneal ulcer with hypopyon.* One-third of the A. C. filled with pus; severe ciliary pain. Patient had been unsuccessfully treated with atropia, iodoform and hot applications for three weeks. On the day after the first injection. (continuing the bandage and atropine), the hypopyon had decreased one-half, and the patient declared he had had his first comfortable night's rest. In four days the hypopyon had disappeared; in a week the ulcer is mostly covered with epithelium.

2. A workman with cornea wounded the week before by an iron splinter. There is a central, necrotic, corneal ulcer. A. C. is half filled with pus. After one injection the hypopyon began to disappear and no trace of it was seen in eight days: the ulcer now began to heal.

The author has had most success in these cases of infected *ulcus corneæ*.

3. Injury of left cornea and lens from a piece of iron a cm. long, which was sticking in the wound through which the iris had prolapsed. Over the eye a dirty bandage. Iron splinter removed an hour after injury and iris cut off. Some escape of lens matter. Atropine, iodoform, and protective bandage. The next day the

eye was perfectly quiet, but on the following day, the patient complained of intense pain in the eye itself; the superior lid was swollen and red, as was also the ocular connective tissue and conjunctiva. The corneal wound infiltrated: yellow-white spots on the iris and hypopyon. A sublimate injection was given at once. Before night time the pain was gone, and the hypopyon had disappeared. In three days the purulent iritis was better, and the wound was almost healed. In a week the only trace of the injury was a traumatic cataract and a *macula adherens*. Light perception and projection good. The author believes the injection saved the eye from an impending panophthalmitis.

4. *A case of purulent iridocyclitis*, (with great tenderness, hypopyon and infiltration of corneal wound) in a man recently operated upon for senile cataract. This patient some years before had had a similar accident in the other eye, leaving him with V. = fingers at 2 m. A sublimate injection was given. Next day patient greatly improved, and after a second injection most of the symptoms disappeared. The eye was irritable for a long time, but finally, after an iridotomy, V. = $\frac{5}{50}$.

A fragment of steel in the lens, cloudy aqueous, corneal wound infiltrated; injected sclera. Foreign body 2x3 mm. removed, through corneal incision, with a pair of forceps. Iris hernia reduced by repositor. Injection. In forty-eight hours wound healed with all signs of irritation gone.

The writer has tried these local injections in cases of parenchymatous keratitis, especially where the origin of the disease was probably syphilitic, but the results were not encouraging, and he does not recommend their use in such cases. He cites one case where the use of the sublimate cut short a well-marked scleritis.

He also recommends it in cases of iritis, specific and other, and gives two examples where it proved of signal benefit. In one of these, the pupil only partially dilated under atropia, was covered with a yellow-white exudation, and there was a hypopyon 2 mm. high. After the symptoms had persisted for weeks under other treatment, a sublimate injection was given, and in forty-eight hours the exudation in the A. C. had gone, and the symptoms improved. Another injection in three days, and in ten days after the first injection the patient was well, with an irregular pupil.

The author thinks that this treatment is especially adapted to those cases where iritic gun-mata are well developed.

In a case of severe *iritis serosa* (cause not given), where after six weeks local and general treatment there was no improvement, ten subconjunctival injections brought about a complete cure.

Gepner now approaches the treatment of deep-seated diseases of the eye by this method. In some cases of chronic choroiditis he thinks he has improved the visual acuity somewhat. In one of these, (chorioretinitis), associated with myopia, the vision rose, after three injections, from R. = $\frac{5}{36}$ and Sn. 0.5 scarcely, to $\frac{5}{15}$ and Sn. 0.5. All the other twenty cases, with myopia and fundus changes, appeared to be more or less benefited by this treatment.

He has also employed the method in a typical case of retinitis pigmentosa with at least temporary improvement.

FRÄNKEL'S DIPLOCOCCUS IN OCULAR PATHOLOGY.

Gasparini,⁴ of Siena, has given the result of numerous experiments and clinical observation in their relation to the causation of certain infective diseases of the eye. They are reported mainly in the form of exhaustive bacteriological studies and were carefully made both by inoculating rabbit's eyes, and by examining the discharges from infected human eyes. The former experiments were divided into four series: 1. Inoculations of cultures upon the conjunctiva. 2. Upon the cornea. 3. In the anterior chamber. 4. In the vitreous chamber. These inoculations produced the most destructive results—the rabbit being especially susceptible to poisoning, local and general, from the diplococcus—and led Gasparini to believe that this microbe is the most important, if not the active agent (especially virulent in purulent nasal and dacryocystic soils), in producing such serious diseases as spreading ulcer of the cornea, hypopyon keratitis, and the like, with their disastrous consequences.

Bacteriological examinations were made of the discharges from twenty-five human subjects, the histories of which are given. In hypopyon keratitis and its associated diseases the diplococcus was found in the discharges, and rabbits were successfully inoculated with the pure cultures. "At this point," says the author, "we come to a question rather embarrassing to me—how does the diplococcus, first of all, come in contact with the eye? How does the assailant reach that organ? How do we also explain cases of spontaneous septic ulceration of these cornea? To all the questions I believe I can now reply in a manner clear and convincing, that the diplococcus of Fränkel is present as a saprophyte upon the normal conjunctiva of healthy individuals, just as it is found in the saliva and in the mucus of the nasal fossæ."

⁴E. Gasparini: *Il diplococco di Frankel in patologie oculare. Annali di Ottalmologia*, 4-5, 1893, 51 pages.

The moral of the story is that simple injuries to the cornea should not be lightly treated in the presence of a dacryocystitis or a purulent rhinitis, nor should we remove a foreign body from the cornea with a dirty spud, or neglect to advise a copious aseptic wash after digging a *corpus alienum* from the same region, lest the diplococcus, lying in wait, enter in and do his deadly work.

THE BROWN-SÉQUARD TREATMENT IN OCULAR THERAPEUTICS.

Two articles in a recent journal on the employment of hypodermic injections of certain organic (orchitic) fluids, after the manner of the late Brown-Séquard, are worthy of notice, although it is questionable whether their value is any greater in ocular than in other diseases. The first is by de Wecker,⁵ who draws attention to the fact that writers on ophthalmological matters, with one exception, have remained silent upon a subject that has in late years attracted so much attention in medical circles.

When Brown-Séquard, four years ago, addressed his first communication to the Biological Society the author applied to him for some of the testicular fluid and desired to be supplied with the proper apparatus, and to be instructed in the preparation of the remedial juices. His idea was to use it in the treatment of patients affected by optic nerve atrophy. A large number of cases of gray atrophy, optic atrophy of central origin and retrobulbar neuritis, were carefully and systematically treated and observed.

The negative results obtained led de Wecker to believe that his method of preparing the organic fluids was defective, so he obtained some prepared by M. d'Arsonval, Brown-Séquard's associate, and repeated the experiments. The results were precisely the same as before; with one or two exceptions the treatment produced no effect.

The exceptions include the case of a lady whose vision (finger counting at 3 meters), rose after these injections to normal in one eye, and was greatly improved in the other. The case was, however, one of retrobulbar neuritis *post influenzzam* which, as everyone knows, is capable of spontaneous improvement, and the organic injections had been alternated with quinine bromohydrate and strychnia nitrate.

The writer also witnessed a temporary arrest of the eye symptoms in several cases of tabes dorsalis, but he very pertinently asks himself whether this may not be the experience occasionally noted

⁵ De Wecker: *Les injections séquardiennes en thérapeutique oculaire. Annales d'oculistique*, November, 1893, 346.

in certain forms of locomotor ataxia? As an answer to that question de Wecker tells of meeting Charcot in consultation over a patient where the diagnosis of tabes was in question. The disposition to show apparent arrest or improvement in these cases, with and without treatment, was referred to by Charcot, and the latter finally and abruptly asked de Wecker: "Have you ever cured a case of tabes?" And the reply, in the form of another question, "and you, my dear Professor?" was met by a silence more impressive than words.

Finally, de Wecker believes the injections to be entirely innocuous, and thinks they may act as a tonic and perhaps produce at the same time a moral effect upon a certain class of patients.

In a footnote the writer speaks of the great cost of the small glass tubes containing the testicular fluid, (20 francs per dozen), thus prohibiting its use in hospital practice. He gives directions how it may be more economically obtained for clinical purposes.

De Bourgon⁶ gives a carefully prepared paper on the treatment of four cases of optic nerve atrophy, the histories of which are furnished in detail. The results in every case were absolutely negative. Not only that, but both earlier and subsequent employment of injections of antipyrin, and the use of additional remedies by the author and others *did* have some measurable effect upon the disease. The first case was one of advanced white atrophy: V. R. = $\frac{1}{6}$; V. L. = p. l., the result of ill defined cerebral changes. The second patient also had well-marked atrophy: V. R. = $\frac{1}{60}$, V. L. = fingers at 3 m. In the third instance there was a secondary atrophy produced by the presence of a cerebral neoplasm. The last case was a diabetic atrophy with very low vision: R. $\frac{1}{50}$; L. $\frac{1}{60}$.

De Bourgon advises the use of antipyrin injections (introduced by Valude), in optic atrophy, and says that two of the above mentioned patients upon whom they were used, obtained greater relief than from all the other measures employed in the treatment of their disease.

SYMMETRICAL COLOBOMATA OF BOTH LENSES.

Chibret⁷ reports the following case:

G., aged 15. An examination of the eyes with a plane mirror shows both pupils to be transversely, symmetrically, and almost equally divided

⁶ De Bourgon: *De l'emploi des injections d'extrait organique de MM. Brown-Séquard et d'Arsonval dans le traitement de différentes formes d'atrophie du nerf optique.* Ibid.

⁷ Chibret: *Colobome symétrique des deux cristallins.* *Revue générale d'ophtal.*, XXII, II, 1893.

into two parts by a dark curved line whose convexity is downwards and inwards. Below this line there is aphakia; above it there is a lens which the writer believes has been used by the patient in learning to read. V. is $\frac{1}{10}$ only; with + 12, D. V. = $\frac{1}{4}$ in both eyes. With + 20, D. patient reads small print easily, but without glasses ordinary type is not made out or is deciphered very slowly.

After dilating the pupils with atropia, both the direct examination and the oblique illumination show the defect in the body of the lens to extend throughout its whole width and thickness while the periphery is, except in the aphakic region, entirely normal. The edges of the coloboma proper, are free of opacities. This can be proved by examining them with a magnifying glass, the opaque appearances shown by the direct examination being due to the irregular refraction and reflection of the light by and from the uneven edges of the coloboma.

OTOLOGY.

NOTES FROM FOREIGN OTOLOGICAL JOURNALS.

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SINUS THROMBOSIS FOLLOWING MIDDLE EAR DISEASE.

Jansen, (*Archiv. f. Ohrenheilk*, XXXVI, 1 and 2, December, 1893). finds that choked disc occurs occasionally in uncomplicated thrombosis of the lateral sinus; infrequently also in uncomplicated pachymeningitis ext. pur.; is most frequent in sinus thrombosis complicated with pachymeningitis ext. pur., next in sinus thrombosis with arachnitis. Occurs frequently with abscess of the brain; it appears also to develop in exceptional cases in uncomplicated empyema of the mastoid. It is always bilateral; it accompanies from thirty-five to fifty per cent of the cases of thrombosis, purulent and non-purulent. The optic neuritis develops within a few days after hyperaemia exists, and does not always stop with the thorough removal of the purulent focus. When the extradural abscess has been evacuated, with or without the incision of the sinus, the increase of the choked disc is not indicative either of

another abscess which has been overlooked or of a fatal result; vision is in the majority of cases not particularly reduced. Recovery requires many months and atrophy does not result. While optic neuritis may be absent in very extensive thrombosis and extradural abscess, its existence is, nevertheless, of value in the diagnosis of sinus thrombosis. Typhus malaria and pneumonia may be positively excluded, and, as a rule, an intra-cranial cause looked for. It must, at the same time, be remembered that the absence of eye symptoms does not exclude the possibility of thrombosis. The clinical and post-mortem examinations of Jansen's cases disprove the assertions of Knies, (*Beziehungen des Sehorganes, u. s. w.*, pp. 147 and 158), to the effect that papillitis is only exceptionally present in other affections than tumor of the brain.

The existence and causation of nystagmus in relation to diseases of the ear are discussed, and in the absence of evidence of affection of the labyrinth or of leptomeningitis is considered as pointing to a phlebitis or peri-phlebitis in the vicinity of the temporal bone.

The diagnosis of sinus thrombosis is made more certain if the jugular vein is involved. It occurred in about one-third of Jansen's cases.

The prognosis is unfavorable: is always fatal in diffuse purulent leptomeningitis; very bad in circumscribed purulent leptomeningitis and abscess of the brain, or when there are extensive pyemic manifestations in lungs, heart, larynx. In view of the fact that meningitic symptoms frequently accompany uncomplicated sinus thrombosis, operation is not contraindicated unless well marked symptoms of arachnitis are present. Metastases in the lungs do not forbid operation.

Of Jansen's forty cases nine recovered. In one of these, however, the diagnosis was uncertain. Since August, 1890, he has opened the sinus thirteen times with six recoveries.

Appended to the paper is an extensive list of the literature of the subject, 197 references.

USE OF THE POLITZER BAG IN UNILATERAL AFFECTION OF THE MIDDLE EAR.

Falta¹ used a manikin in his preliminary experiments. When affection is unilateral with perforation of drumhead, if one inserts a small tube in the nostril on the side of the healthy ear, the air

¹ Eine neue methode zur Behandlung der Einseitigen mittelohrerkrankungen mittelst Luftdouche. *Wien, med. woch.* 1892, No. 52.

which would otherwise enter that ear escapes by the tube. When there is no perforation it is advisable to increase the resistance in the healthy ear by closing the external auditory meatus on that side with the finger.

The effect of the air douche upon the affected ear is the same as when the bag is used in the ordinary way.

NEW CASE OF OTOLITH.

Secchi, (*Archiv. Ital. di Otol. Rinol. e Laringol.*, 1893, 1), reports one found in an ear in which persistent suppuration followed measles. Microscopic examination demonstrated a kernel of cotton with stratified layers of calcarous matter surrounding it.

FOREIGN BODY IN THE TYMPANIC CAVITY. EXTRACTION. TETANUS.

Schmiegelow, (*Revue de Laryngol., etc.*, March, 1894), reports a case which emphasizes the disastrous consequences which may result from unskilled attempts at the removal of foreign bodies from the external meatus. According to the mother's story, the stone which was put in the ear by the child could be distinctly seen. The physician to whom she was at first taken, used forceps instead of trying to remove it by syringing. The stone was pushed through the drumhead, and an acute suppurative middle ear inflammation resulted. When Schmiegelow saw it eleven days after, it was impossible to remove it through the canal and the auricle was detached, a portion of the posterior superior wall removed, and the stone extracted. Two days after this operation the first tetanic convulsion occurred. Death followed forty-eight hours later. The bacilli of tetanus were, in the writer's opinion, in the particles of earth on the stone. The usual period of incubation in man is from four to eight days.

INJURIES TO THE EAR CAUSED BY FIREARMS.

Binaud, (*Arch. gen. de med. avril et mai*, 1893), reviews completely the causes, symptoms, diagnosis and treatment of these accidents. The question of immediate surgical interference is discussed at length.

CONTRIBUTION TO THE STUDY OF THE STATISTICS OF EAR DISEASES.

Gradenigo, (*Annales des mal. de l'oreille, etc.*, October, 1893). We shall before long be able to predict the probabilities with

respect to the ear to be affected, our age at that time, the particular disease with which our ear is to be favored, much as life-insurance experts inform us as to the year of our demise. The latest statistician is Gradenigo of Turin, whose papers so frequently enrich the principal otological journals of Italy, Germany and France. Some of the tables presented in his most recent paper are of considerable interest, and it is, perhaps just as well to know that if one is a man and only one ear is to be affected the chances are that it will be the left; if, on the other hand, one has the good fortune to be a woman, let her watch with care the right.

DEAFNESS AND SYPHILIS.

Delie. (*Annales des mal. de l'oreille, etc.*, August, September, October, 1893).

The relations of tertiary syphilis to the ear are very fully considered. The October installment deals with the treatment which is discussed under the following heads:

1. Pilocarpine, which is to be administered as soon as possible, the dose varying according to the age, constitution, condition of heart and kidneys, etc., of the patient.

2. Strychnine, but little employed.

3. Mercury, "the anchor of safety." The best method of administration is that which gives the most rapid effect, (*a*) hypodermic injections of sublimate. Painful; are never used in children; therapeutic action weak, because the sublimate is so rapidly eliminated from the system. When employed at all the following formula is recommended:

Corrosive sublimate	1,0.
Sod. chlorid	2,0.
Cocain hydrochlor	0,30.
Aq. dest.	100,0.

Salicylate of mercury, though less painful and not so likely to produce abscess, is too weak. (*b*) Injection of calomel; use in this way is apt to expose patient to the danger of toxic accumulation of mercury in the system.

Calomel	0,50.
Liquid vaseline	10,0.

- (*c*) Sublimate baths not to be recommended.

- (*d*) The use of a mercurial ointment—the quickest, most effective and most lasting. In adults 2-6 grammes to 8-10 grammes of excipient daily until slight salivation occurs. In children $\frac{1}{2}$ to

1-2 grammes a day or every second day if child is cachectic. (e)
In infants and those who cannot bear inunctions, the internal administration of the drug is to be recommended.

4. Iodide, in adults 1.50—4 to 8 grames a day.

5. Continuous current.

The most effective treatment will always be the preventive.

NOTES FROM CURRENT AMERICAN OTOLOGICAL LITERATURE.

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DENTITION WITH DISEASE OF THE TEETH AS A CAUSE OF EAR DISEASE.

An article on this subject by Dr. Laurence Turnbull, (*Medical and Surgical Reporter*, March 31, 1894), presents so many practical points of interest as to warrant a full abstract:

Every physician of experience has found that eruption of the teeth is a cause of earache, followed by pain and a discharge of pus and a laceration of the drum membrane. Especially so when (as frequently happens), the teeth are so impacted that they cannot erupt, if not relieved by lancing the gums. Again, the so-called wisdom teeth, from their reflex irritation and pressure, are a cause of deafness and should be removed. Caries of the teeth, caused by acids and fungi (*leptothrix fuocatis*), is usually attended by both toothache and earache from extension into the ear by the Eustachian tube.

If children and adults are of feeble frame and the vitality is lowered by constitutional diseases like syphilis, scrofula or consumption, the teeth are generally of a chalky-white color, brittle or soft, and decay with great rapidity by the action of the *leptothrix* living on carious stumps, which decay impairs digestion and nutri-

tion. When a cold is taken, these stumps being dead, there is almost always an attendant coryza. This affects the ears, causing a running ear, better known by the term *otterrhea*, but more correctly as an acute *otitis media catarrhalis* or *purulentia*. Trophic changes also occur in the Eustachian tube or middle ear with alveolar abscess or with disease of the antrum of Highmore. The nasal mucous membrane is also a fruitful cause of ear trouble.

The tartar, it is stated, protects the tooth substance, but by pressing away the gum and causing absorption of the process, it causes irritation and loosening of the teeth, and gives rise to changes in color and healthy character of the gums, and the whole buccal mucous membrane; this red condition extending into the throat and ear is often an indication of disease of the bronchial tubes and lungs.

In hospital and surgical practice a solution of the permanganate (24 grains to the ounce), is usually kept on hand as an antiseptic, deodorant and detergent. Of this solution half a drachm, or thirty drops, may be added to a pint of boiling water, this can be used in the nose, mouth, throat and ear when there is a discharge of pus from the meatus.

In passing we would simply state our personal experience in regard to dental plates. These should be of gold, platinum and dark vulcanite. Certain forms of vulcanite colored by mercury (vermillion), we have found to produce disease of the gums and buccal cavity extending to the ear.

In regard to fillings, we prefer gold, but there are cases in which gold cannot be used; then a soft material should be used free from acids and mercury.

The following is a list of some of the diseases of the ear due in part or wholly to reflex irritation of the teeth: Acute and chronic catarrhal inflammation of the middle ear; acute, subacute and chronic purulent inflammation of the middle ear; *otitis externa*, alveolar abscess and *ozena*. Sometimes we have found the metal filling forced down into the jaw by too great a pressure of the mallets which are now used, and in one case such was the cause of profound deafness; hearing was improved after the removal of the pressure. Such a case as this, however, is fairly to be charged to malpractice. No dentist should dream of packing gold or other metal in the apices of the roots; the apices may be closed with other kinds of stopping, (none of which ought to be, nor usually is, so forced as to extrude), and then the body of the root is filled with gold or other material.

REMOVAL OF THE OSSICLES IN CHRONIC DISEASES OF THE MIDDLE EAR.

Dr. H. McMorton (*Northwestern Lancet*, March, 1893). concludes an exhaustive paper on this subject as follows:

1. Whatever theoretical grounds may be taken to the contrary, these operations within the middle ear are free from unpleasant sequelæ as any other surgical operation.

2. In cases where an exploratory opening is made in the drum-head for mobilization, or removal of stapes, or incus, cocaine may be used as the anesthetic. In cases where it is best to remove the membrane entire, with one or more ossicles for chronic discharges, it is best to give general anesthesia.

3. The operation of partial myringectomy with removal or mobilization of one or more bones of the middle ear is the only possible means to cure many cases of chronic tympanic vertigo.

4. The results in the sclerotic (also called atrophic) form of chronic catarrh are not as good as in the hypertrophic as regards improving the hearing, and in neither of these is the prognosis as favorable for the improvement of hearing as in disturbances in the transmitting apparatus resulting from chronic purulent disease. In a letter from Dr. Frederick L. Jack, of Boston, he sums up by saying:

"In the hypertrophic cases there have been a few remarkable improvements in hearing, some only slightly improved, and others not at all. In some twenty cases of sclerosis the results were very discouraging. I should say less than five per cent were permanently improved."

5. It is the only rational resort in cases of severe tinnitus due to organic change in the transmitting apparatus, and the results are exceedingly satisfactory in such cases.

6. In chronic discharges that have resisted the ordinary methods, the obstruction to the free exit of purulent secretion should be removed, the cavity freed from unhealthy tissue and treated as any suppurating wound elsewhere.

THE USE OF PILOCARPIN IN DISEASES OF THE MIDDLE EAR AND LABYRINTH.

Dr. Jirmunski, (*Medical Record*, March 31, 1894). states that his experience with the use of pilocarpin in acute disease of the middle ear and labyrinth has been a satisfactory one. In old cases it is quite useless, both when used subcutaneously and by direct instillation. He relates two cases of deafness due to acute disease

of the labyrinth, which were rapidly cured by the use of pilocarpin. The first case was a young man aged 19, who fell down some steps, was unconscious for upward of two hours, and had quite an extensive hemorrhage from the left ear. Thirteen days after there was found complete deafness to both bone and air conduction in the left ear. The diagnosis was traumatic labyrinthitis with hemorrhage. Pilocarpin 0.004 gm. dose was injected subcutaneously and this amount increased daily one milligram till 0.02 gm. was reached. At the same time, every second day, four to ten drops of a two per cent solution of iodide of potassium was dropped in the ear. After the fifth injection, hearing in the left ear began to be present, and after nineteen injections hearing was quite restored. The second case was one of syphilitic labyrinthitis with sudden advent of deafness, which was handled in a similar manner. After twenty-four injections the patient's hearing was entirely restored.

EAR COMPLICATIONS OF INFLUENZA.

* Dr. Ramon Guiteras (*Medical Record*, January 20, 1894), in an article on the causes, complications and treatment of la grippe, says that "Eustachian catarrh and otitis media are complications which exist in a great many cases, and are at times only noticed by the specialist, general practitioners frequently attributing the symptoms to the neuralgic pains of the disease, or to a sense of fullness due to quinine, which is being taken by almost all influenza patients; and thus ruptures of the tympanum have occurred in many cases where paracentesis ought to have been performed."

Dr. Edwin R. Maxson (February 17, 1894), in speaking of the treatment of influenza, suggests "that in cases in which the structures of the internal ear or of the eye become involved, blisters back of the ears, to the back of the neck, and temples may be required and perhaps repeated."

RHINOLOGY AND LARYNGOLOGY.

ABSTRACTS FROM CURRENT LARYNGOLOGICAL
AND RHINOLOGICAL LITERATURE.BY M. D. LEDERMAN, M. D.,
OF NEW YORK.THE PATHOLOGICAL AND CLINICAL FEATURES OF ATROPHIC
RHINITIS.

Mr. Wyatt Wingrave, (*Journal L. et R.*, VIII, No. 2). In a highly interesting paper, the author expresses the opinion that atrophic rhinitis is a specific disease. He describes the histological changes observed in portions of tissue removed from living subjects, and bases his statement on the pathological metamorphoses. The most striking feature noticed was the presence of hyaloid bodies which increase in number with the duration and severity of the disease. "They consist of small, refractive, rounded, homogeneous masses, imbedded for the most part in the interlobular tissues of the glands, and in the adjacent lymphoid tissue, but are also seen amongst the surface stratified epithelium. Glandular changes were found to vary from a simple cloudy swelling of the secretory cells, with blocking of the lumen, to a complete disorganization of the acini by ingrowth of small cell inflammatory tissue. In every specimen the lymphoid tissue gave evidence of change." No distinct characteristic degeneration was observed in the bony structure. Mr. Wingrave explains the analogy existing between dry catarrh and lupus, and states that the former does not ulcerate spontaneously, but ends in sclerosis.

The most impressive uniform change noticeable was "the disappearance of lymphoid structures. In fifty-six of sixty cases, the faucial and pharyngeal tonsils had entirely disappeared."

He thinks shrinking of lymphoid tissue a significant feature of the disease. He does not believe that atrophic rhinitis is the result of a badly treated catarrh. Constitutional influences are important factors in its production. In thirty-seven cases he obtained a definite family history of phthisis. The average age

for the appearance of the affection was seventeen. There were forty-nine females and eleven males. "In females it was the exception to find them not suffering from leucorrhœa or amenorrhœa, and in every instance the nasal phenomena were intensified at the menstrual flow."

During the disease the nasal mucous membrane becomes converted into a cutaneous structure with a corresponding change in secretion, (a perverted function). The author did not find pus cells in the nasal discharge, and therefore disagrees with authorities who name the secretion pus or muco-pus.

OPERATION FOR DEPRESSED NOSE.

S. K. Ellison, M. R. C. S., Eng., (*The Lancet*, No. 7, Vol. I, 1894).

The author offers an original operation for cosmetic improvement. He thinks the want of success in other methods was due to the non-perforated supports used. He used a perforated gold plate.

"An incision with a tenotomy knife is made on either side and across the nose a couple of lines below the lower part of the depression. The flap is raised sufficiently to permit the plate to rest upon the subjacent tissues. The flap of integument is then drawn over the plate and sutured with horsehair along the line of incision: a thread of catgut as a drain being inserted in the lower portion of the incision to be removed in twenty-four hours. Collodion was painted over the line of wound but not at the point of drainage. The parts healed by first intention and no discomfort was experienced by the patient. The plate has been in position for seven years, and no inconvenience has been complained of by the wearer."

SUBLIMED SULPHUR AS A LOCAL APPLICATION IN DIPHTHERIA.

Dr. C. Bäumler, of London, (*British Medical Journal*, No. 1731.)

After repeated trials of many medicaments, the author states that applications of powdered sulphur to the diseased mucous membrane have given better results than any local application which he has tried before. The powder is applied with a camel's hair brush every hour or two, or three times a day as indicated. He has seen cases of gangrene of the uvula and soft palate take a favorable

turn under its use. Gargling with a weak solution of potassium permanganate is recommended. How the sulphur acts he is unable to say, but thinks same is purely local.

SARCOMA OF THE LARYNX.

Dr. F. T. Paul, Liverpool, (*Liverpool Medical Chirurgical Journal*, No. 26).

The author reports two cases, *i. e.*, an intrinsic and extrinsic manifestation. In the first case the larynx of a healthy-looking lad, 12 years old, was filled with a large white cauliflower-like mass, rising nearly to the tip of the epiglottis. Macroscopically it resembled papilloma, but the microscope revealed its malignant nature. An extra laryngeal operation was performed in the usual manner. The growth was removed with the curette, but no portion of the larynx was excised. The boy made a good recovery; the wound healed by first intention. Ten days after the operation the tracheotomy tube was discarded. Five months later the patient was still free from a recurrence. The author thinks clinical experience affords much evidence of the mild and modified character of the malignancy of sarcoma in this position, and so encourages operators to remove the growth without sacrificing the organ.

SUPPURATIVE PERIOSTITIS OF THE LEFT INFERIOR TURBINATED BONE DUE TO A DISEASED TOOTH.

Dr. R. Dreyfuss, Strasburg, (*Wiener Medizinische Presse*, Vol. XXXV, No. 10).

This peculiar condition was observed in a woman 28 years old. The patient noticed a swelling of the left cheek which gradually extended towards the nose. No fever accompanied the swelling; pain was not severe. Examination found a swelling of the inferior turbinated bone. A diseased tooth was present in the upper alveolar process, left side, but same was not painful. Expectant treatment was prescribed as no suppuration was then present. A week later the patient expectorated some foul-tasting pus which came into the mouth posteriorly.

A puncture was made with a Pravaz syringe, and a syringe-full of pus was obtained. The second attempt brought blood. The maxillary antrum was free from pus. Granulations over the inferior turbinated were reduced by means of galvano-cautery, followed by applications of trichloroacetic acid. Boric acid solution was the cleanser prescribed. A swelling at the inner angle of

the eye was filled with serum; the probe did not reveal denuded bone. The periostitis was secondary to caries of the second molar.

PRIMARY ERYSIPELAS OF THE LARYNX.

Herzfeld, Berlin, (*Journal L. R. et O.*, Vol. VIII. No. 3).

The attack appeared suddenly in a patient 25 years of age. Difficulty in swallowing, shivering, with pains in the neck, were the symptoms at the onset. A few days later, suffocative attacks were experienced. Laryngoscopic examination showed edema of the epiglottis, ary-epiglottic folds, arytenoid cartilages, and ulceration of the epiglottis. The condition ended favorably under ice treatment. Streptococci and staphylococcus pyogenes aureus were found in the bacteriological examination.

THE USE OF DILATING SOUNDS IN NASAL SURGERY.

Winckler, Bremen. (*Internationales Centralblatt für Laryng., Rhinolog., etc.*, Vol. X. No. 9). recommends the employment of nasal bougies in hypertrophic rhinitis. The parts should be cocaineized before introducing the instruments. A salve of cocaine and vaseline should be applied to the sound as a lubricator. This method is of especial value in cases of squechnia, resulting from previous operation. (In this sequela I have found the substance, spunk, or "surgical sponge," of great service in preventing these adhesions from forming. M. D. L.)

PRIMARY GRANGRENE OF THE PHARYNX.

M. B. Blumenan. (*Ibid*), reports a case of gangrenous ulcer of the right tonsil following a naso-pharyngeal catarrh. In spite of treatment it extended to the gums and hard palate in three weeks. Severe pain, foeter from the mouth, and high temperature were marked symptoms. Patient died at the end of three weeks. He had previously suffered from gingivitis with bleeding from the gums and nose. Scurvy was suspected.

BACTERIACIDE PROPERTIES OF THE NASAL MUCUS.

Wurz and Lermoyez, (*Ibid*), state that the nasal cavities are a common site for an assemblage of numerous bacteria. Their disturbing effects, however, are prohibited by the powerful antiseptic properties of the normal nasal mucus. This assertion has been proven by experimentation.

TWO CASES OF CONGENITAL HYPERTROPHY OF THE
TONGUE.

Dr. W. F. Chappell, New York, (*Manhattan Eye and Ear Reports*, No. 1).

This odd manifestation was observed in a male 35 years of age, and in a female 17 years of age. Cold and indigestion brought on acute symptoms. Menstruation had a similar effect in the second case. There was a general varix in both instances. Operative interference was contraindicated on account of the numerous vessels implicated. Hygienic and dietetic treatment was prescribed.

BOOK NOTICES.

AN OUTLINE OF THE EMBRYOLOGY OF THE EYE. By Ward A. Holden, A. M., M. D., of New York. G. P. Putnam's Sons publishers. New York. Price 75 cents.

This little book of about 100 pages won the Cartwright prize for 1893. It is based upon the examination of a great number of specimens—embryos of chicks, pigs, etc., and shows good careful work and observation. The numerous illustrations are from original pen-drawings by the author, and are all good. The book is handsomely printed.

DUANE'S STUDENTS' DICTIONARY OF MEDICINE. The Students' Dictionary of Medicine and the Allied Sciences. Comprising the pronunciation, derivation and full explanation of medical terms, together with much collateral descriptive matter, numerous tables, etc. By Alexander Duane, M. D., Assistant Surgeon to the New York Ophthalmic and Aural Institute: Reviser of Medical Terms for Webster's International Dictionary. In one square octavo volume of 658 pages. Cloth \$4.25; half leather \$4.50; full sheep \$5.00. Philadelphia, Lea Brothers & Co., 1893.

The omission of obsolete and rare terms and the presentation of words in actual use, only, with their accurate and brief definitions makes "The Students' Dictionary of Medicine" one of the most convenient dictionaries for the student and reading physician to consult. Descriptive and explanatory matter being arranged under special headings, instead of being represented by inadequate definitions, will merit the approval of all who consult the Dictionary, as the causation, symptoms, and treatment of diseases—the origin, description, and therapeutic action of drugs can be readily ascertained at a glance. Anatomical data—Bacteria. Fermentation, etc., are exhibited in tabular form so as to enable the student to fasten their descriptions in his memory.

The typography, paper and binding are as good as could be desired.

A TEXT-BOOK OF DISEASES OF THE EAR AND ADJACENT ORGANS. By Dr. Adam Politzer, Imperial Royal Professor of Aural Therapeutics in the University of Vienna; Chief of the Imperial-Royal University Clinic for Diseases of the Ear in the General Hospital, Vienna. Translated into English from the third and revised German edition, by Oscar Dodd, M. D., Clinical Instructor in Diseases of the Eye and Ear, College of Physicians

and Surgeons. Chicago. Edited by Sir William Dalby, F. R. C. S., M. B., Consulting Aural Surgeon to St. George's Hospital, London. In one large octavo volume of 748 pages, with 330 original illustrations. Cloth \$5.50.

It is a pleasing task to read so complete and exhaustive a work as Professor Politzer's "Text-Book on Diseases of the Ear." The author has brought this edition up to date and discussed the injection of pilocarpin, deafmutism, and the newer methods of aural surgery, such as excision of the drumhead and ossicles, and chiseling away of the posterior superior wall of the meatus, the latter being illustrated by numerous wood cuts. The extensive index of literature gives evidence of the fact that the labors of others have also received due consideration.

The entire appearance of the work—the paper, the printing and the illustrations—is excellent.

NEW TRUTHS IN OPHTHALMOLOGY. By G. C. Savage, M. D., of Nashville, Tenn. Published by the author.

This book contains 152 pages, thirty-two illustrations. The contents consists of a number of meritorious papers contributed to the literature of Ophthalmology by Dr. Savage.

The paper, printing and binding are in keeping with the merits of the contents of the book. Very good.

A NEW OPHTHALMOLOGICAL JOURNAL—THE REFRACTIONIST—We have been waiting for *The Refractionist* and it affords us much pleasure to announce its arrival. The first number contains good practical and useful papers by men with well-earned reputations.

It is edited by Francis F. Whittier, M. D., of Boston, in conjunction with Dr. W. F. Southard, of San Francisco; Dr. W. E. Baxter, of Bangor, Me.; Dr. J. W. Park, of Harrisburgh, and Dr. E. M. Marbourg, of Pueblo, Colo. It is a journal of practical ophthalmology and an exponent of the refraction world. The first number presents a good appearance, and we wish *The Refractionist* a long and useful life. It will be published monthly. Subscription price, \$2.00 yearly. Subscriptions should be addressed to the editor, Dr. Francis F. Whittier, 74 Boylston street, Boston, Mass.

PROFESSIONAL NEWS.

The programme of the Section on Laryngology, Rhinology and Otology of the Louisiana State Medical Association contains the titles of a large number of papers. The section will be well represented, and an interesting and profitable meeting is expected which will take place in New Orleans, May 29, 1894. Dr. W. Scheppegegrell, of New Orleans, is chairman of the section.

Dr. Dunbar Roy, of Atlanta, Ga., was elected to the chair of Ophthalmology and Otology in the Southern Medical College while he was in Europe last year, and he accepted the professorship and entered upon the duties thereof on his return to America.

Dr. Walter R. Parker, late house-surgeon Wills' Eye Hospital, Philadelphia, has located at 32 Adams Avenue West, Detroit, Mich.

Dr. Hiram Woods of Baltimore, informs the ANNALS that the General Assembly of the State of Maryland has just enacted a bill for the prevention of blindness, it being the fifth State to enact such a law.

Dr. J. P. Parker, 701 Olive Street, Saint Louis, Mo., has been advised that there is a good opening for a well-trained Ophthalmologist in a beautiful city of about 50,000, west of the Mississippi river. The name of the city and full particulars will be furnished any subscriber to the ANNALS on application. (Enclose stamp to pay postage on answer).

DESCRIPTION OF A SET OF TEST CARDS AND
CABINET FOR HOLDING THE SAME.

BY JOHN WELSH CROSKEY, M. D.,

PHILADELPHIA, PENN.

ONE OF THE ASSISTANT SURGEONS TO WILLS' EYE HOSPITAL.

THE very short life of the test cards now in general use led me to think of some means by which their life and usefulness could be prolonged. I made the first of these cards and cabinets for use in the clinic of the Wills' hospital where it proved of such advantage over the ordinary hanging test card, and met with such favorable comment that I was induced to further perfect the mechanical parts as shown in the wood cuts on next page.

Fig. 1 shows the cabinet closed. Fig. 2, cabinet open, showing the test cards of which there are five. The cards are composed of letters and characters after Snellen, each letter is so made that when at its proper distance each part of it is separated from the other parts by an interval equal to not less than the arc subtending an angle of one minute at the nodal point and the whole letter subtending an angle of five minutes.

There are two cards composed of English letters, one card having letters with shoulders, and the other card, letters without shoulders. There is a German text card, an illiterate, or incomplete squares and the astigmatic card, on which I have used two disks instead of the one disk with the crossed lines.

All the letters and characters are marked to correspond one with another. The largest letter being for sixty diopters, the next for thirty-six, twenty-four, eighteen, twelve, nine, six and five diopters. The last character to the bottom lines indicates the distance at which these lines should be read.

I think this is the first set of test cards published that are marked to correspond one with another. The cabinet contains six grooves. The quality of the cardboard is very good, being heavy white bristol board. The cards being in a case, when not in use, the case can be closed and the cards protected from dust, fly specks, etc.

The case with which the cards can be removed from the cabinet is a point in its favor for patients who are unable to read six-sixtieth type. The plate glass door shows at a glance what the cabinet contains. Mr. Fox of the Fox Optical Company having seen the cabinet in use at the hospital, and desiring to place the same within reach of some of their patrons has asked and received my permission to publish and manufacture the cards and cabinets.

OBITUARY.

Dr. William Dickinson left Saint Louis January 24, 1894, with the intention of visiting in California for the purpose of recuperating, as his health had become impaired from the fatigue of professional cares. The long journey and sudden change of climate exhausted his vital forces, and he died a few days after reaching the home of his daughter at Stanford University. Dr. Dickinson was one of the pioneers in ophthalmology. He graduated from the Harvard University Medical School in 1851, after which he spent about five years in Germany, France and England visiting the various clinics and hospitals. Dr. Dickinson was fortunate enough to study with Arlt, Jaeger, Von Graefe, Sichel and Desmarres while ophthalmology was undergoing a process of evolution from an obscure and uncertain art to a well-defined exact science, which was brought about by the invention of the ophthalmoscope (1851), as it cast light into a cavity which before had been dark.

Dr. Dickinson continued his studies until 1857, after which he located in Saint Louis, where he practiced and taught ophthalmology continuously up to the day he left the city, excepting during the war, when he was commissioned Brig. Surgeon U. S. A. by President Lincoln. He was prominent in medical societies, and was consulting surgeon to various hospitals in the city. His labors in the interest of a State Eye and Ear Hospital form an important part in the transactions of the Missouri State Legislature of 1861 and 1872. He had bills introduced providing for the Missouri State Eye and Ear Hospital which were defeated each time by a small vote. He never became discouraged, but hoped to see such an institution built that would afford proper care and treatment for the unfortunate class of people who lose their sight and hearing, and become expensive wards to the State, for the want of proper care, and it is a lamentable fact, that Missouri has more blind than any other State, according to population (*vide* U. S. census). In placing the vast number of records, resolutions, bills, articles of incorporation, subscription lists, communications, etc., concerning the Missouri State Eye and Ear Hospital, in the hands of the writer, Dr. Dickinson expressed the hope that the information contained therein would not be lost, but would fall in good ground, and bear fruit that might be seen by those in whose behalf he had made the best efforts of his long life.

As a man, Dr. Dickinson was exemplary in life, high in ideal, steadfast in pursuit, conscientious in method, just in dealings, truthful in engagements, courageous in expression, and gentle in manner.

As a friend, Dr. William Dickinson was one in whose heart the angles of incidence and reflection were rendered equal from a surface unruffled by pride or any selfish quality. J. P. P.

TO CONTRIBUTORS.

COMMUNICATIONS *are invited from all parts of the world.*

Authors who propose to favor the ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY with contributions are requested to observe the following:—

1. In accepting an article for publication under the head of "ORIGINAL COMMUNICATIONS," it is done with the understanding that it is to be contributed to the ANNALS *exclusively*, and that copies or abstracts of the same have *not* been and will *not* be published in any other journal.

2. Writing must be distinct and plain, and *especially all proper names.* (*If possible a manuscript should be type-written.*)

3. Proofs will be furnished authors for correction and revision, but it is requested that alterations be limited to what is of essential importance, as changes in the copy are equivalent to resetting, and cause additional expense and much annoyance.

4. The ANNALS especially desires brief, mature, concise articles on practical subjects, as its readers are busy physicians who desire results, therefore the author who condenses expression enhances the value of his contribution and is rewarded by having it extensively read.

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When two or more original articles upon the same subject are received, the shortest, most pithy and concise will take precedence.

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ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY.

JULY, 1894.

THE TREATMENT OF HETEROPHORIA—AN
ANSWER TO DR. GOULD.

BY ALEXANDER DUANE, M. D.,
OF NEW YORK.

DR. Gould in the January number of the ANNALS calls attention anew to his innervational theory of heterophoria, and to a method of treatment which he regards as new and which he seems to consider universally applicable. The paper, while of value in bringing into notice once more a method which has doubtless been too much neglected, proceeds upon what appear to me such erroneous assumptions, that I have ventured to take up the space of the ANNALS in a consideration of some of the points involved.

In the first place Dr. Gould's method of treatment is by no means new. I myself have employed it for eight years, and when I began using it did not think of calling it new, for I was well aware that it had been known and practiced for many years before that—notably by Dr. Stevens from whom I learned it. I have employed it continuously with more or less success ever since, without, however, being led to ascribe to it the great value that Dr. Gould gives it. I have heard other ophthalmologists speak of it and supposed that it was the common property of the profession, and was therefore quite surprised to see it brought forward as something novel.

This, however, is a matter of very trifling moment. The real question at issue is whether Dr. Gould's theory is correct, and if the claims that he makes for his method of treatment are valid, for if so all our ways of dealing with heterophoria (and for that matter with squint as well), will have to be revolutionized. It becomes us therefore to examine the arguments upon which he bases his theory. These are as follows:

“(a) In convergence-adduction, the muscles overcoming the maximum prisms, bases out, that is possible, either internal rectus may be made to greatly increase its contractile power by simply carrying the object to the left or the right side of the field.

“(b) Extreme adduction (twenty feet) of exophoric eyes may be doubled, often trebled, in a minute or two by the device of slowly carrying the object gazed at, with weighted convergence-stimulus from the near to the distant point. If, as I said, one can lift with his arms only 200 pounds, one cannot lift 400 or 600 pounds in a minute by any analogous change of the method of lifting.

“(c) The extreme of primary adduction-power, and even the double of this extreme, may be held for several minutes, even half hour or more—I don’t know how much longer. The extreme lift of other bodily muscles can only be held an instant, and not only this, but constant and uninterrupted tension or contraction of such muscles in lifting even very small weights is impossible.¹

“(d) Besides all this, such constant tension, when solely muscular, is painful, even agonizing, if demanded by the will or by necessity. In the case of exophoria, the extreme of prisms, and even the double of the extreme, bases out, that can at first be held without diplopia, is in a minute or two continuously held without the faintest suggestion of pain or even of discomfort.

“(e) Muscular tissue, as such, cannot be made to double or treble its volume or its strength in a few hours or days, or even in a few weeks, but such increase of ocular adduction-power I see many times every day.”

These arguments present some facts very familiar already to ophthalmologists, although they do not, I think, substantiate the thesis which Dr. Gould would base upon them. They do prove that the initial maximum of convergence, as measured by the degree of prism, base out, which a patient can overcome on the

¹ The statements contained in this and the following paragraph are only partially true if they mean that the adduction can be exercised up to an indefinite point without fatigue and that the exercise can be carried on indefinitely without causing distress. As a matter of fact, as soon as we push the use of prisms beyond 25¹ (representing only 13¹ of convergence, or less than one-fourth of the maximum that the patient can do), a sense of strain is apparent, and the effort cannot, as a rule, be kept up more than a few minutes. In this regard the internal recti are not essentially different from the other muscles of the body. With all of them the principle holds that they are capable of sustaining a continuous exertion only when that exertion represents a fraction of the total power of the muscle engaged and when the movement performed is an habitual one or one that has been made habitual by constant practice.

first trial, falls far short of the total power of convergence which the interni can be made to exert; but this most of us have known for a long time. No one, in fact, who is acquainted with the subject supposes that because a patient fails to overcome the diplopia produced by a prism of 15° , placed base out, this figure represents the actual degree of convergence of which he is capable. The very fact that he can converge through a much greater angle in looking at near points would alone disprove this. And hence the fact that he can suddenly double or treble his initial (apparent) maximum of convergence simply proves that the power was there all the time and that the facility to apply that power was lacking.

As a matter of fact, the reason why we so readily learn to perform adduction at a distance and can maintain the effort so long without fatigue is because it is a movement that we have been carrying on all our lives at near points in reading, writing, and doing all other kinds of close work; and the reason why we find any difficulty at all in doing it at first is that we have not been accustomed to performing the movement in that way, and have not, we may say, the knack of it. We are in the position of a skillful tennis-player who, obliged to forego the use of his right hand, tries to play with his left. His strokes at first are uncertain and ridiculously feeble; the straight drives that he executed with his right hand are replaced by futile pushes; and yet the strength of the left arm fully equals that of the right, and all that is lacking is the directive power.

It is readily conceded therefore that defective convergence is innervational in character, *i. e.*, it is due to lack of the proper nervous impulse, and its existence simply means that in this particular respect the patient's co-ordination is defective, and that he does not know how to use the power that he is already amply endowed with. But this fact, although restated with much force by Dr. Gould is by no means new; and what is more to the purpose, we are not at all justified in deducing from it the inference that he has made, *i. e.*, we cannot say that because deficiency in convergence is due to a failure of innervation, the exophoria which may be associated with it is also necessarily due to the same cause. This, to be sure, would follow if we admitted that the exophoria was the result of the failure to converge, but Dr. Gould really adduces no arguments to prove this, except that as the result of exercising the convergence the exophoria disappears. This fact, however, is quite susceptible of another explanation, and, on the other hand, there are facts which show that the exophoria is not in

all cases, or even in the majority of them, due to any anomaly of convergence-innervation.

In the first place, if this theory were universally true, all patients with exophoria should have deficient, and all patients with esophoria excessive primary adduction power. This is far from being the case. Many patients with exophoria can at once overcome prisms of 20° and 30° or more, while in esophoria it is sometimes the case that the primary converging power for a distance is defective, so that such patients can scarcely overcome 10° or 12° at first.²

Again, if Dr. Gould's innervational theory is correct, cases of esophoria ought to yield uniformly to exercise of the abduction conducted by placing prisms, base in, before the eyes; and, indeed he speaks as if this had been his experience in this class of cases. He admits, however, that the instances of esophoria and of hyperphoria that he has met with have been few³ and the

²Thus in forty-two cases of exophoria in which I determined the convergence capacity, fifteen had normal power to start with, and twenty-seven defective convergence. But, as a matter of fact, the discrepancy in number between the cases with normal and those with defective power is not as great as these figures would imply, for of the twenty-seven with low converging power only four were cases of simple exophoria, the rest being cases of transition between exophoria and squint, (*i. e.*, those in which the divergence was so great that the patient was no longer making any effort to converge), or cases complicated either with hyperphoria or with a parietic condition of the superior or inferior rectus.

³To anyone who has done much work in connection with muscular anomalies it will seem strange that Dr. Gould should speak of the cases of esophoria and hyperphoria as being infrequent. In the practice of other ophthalmologists they are found with considerable frequency, esophoria being present in about the same proportion as exophoria and hyperphoria being more frequent than either. Thus in 208 consecutive cases which I examined I found

Esophoria.....	39
Exophoria	43
Hyperphoria { simple	14
{ combined with esophoria	38
{ combined with exophoria	37
Mixed conditions, (<i>i. e.</i> , esophoria alternating under certain conditions with a divergent strabismus, or a state in which insufficiency of both superior and inferior recti balancing each other, produced orthophoria in the primary position).....	7
Uncertain or variable.....	8
Orthophoria	25
Total.....	208

results which he has attained with them have been inconclusive. My own experience extending over eight years, in which this very method has been tried in this particular kind of heterophoria over and over again in a great number of cases, has convinced me that in the vast majority it is totally inefficacious, the esophoria remaining precisely the same after repeated careful exercise of the abduction. Nor is the latter susceptible of being trained like the adduction. Given a primary abduction of 5° , this remains unchanged in spite of the most strenuous efforts of doctor and patient until a tenotomy is performed and then it mounts *pari passu* with the diminution effected in the esophoria by the operation. In fact, the only cases in which training of the abduction has seemed to me efficacious are those which have been subjected to a tenotomy and in which the tendon, as a result of its division, is left free to attach itself as it will. Here a judicious exercise of the abduction directly after the operation may serve to displace the point of attachment of the severed tendon and by causing its reattachment further back may diminish the esophoria.

Nor does the fact that an exophoria is relieved by exercising the interni prove that the condition is necessarily due to faulty innervation of the latter. In several cases of exophoria which I have treated with fair success in this manner the cause of the divergence was clearly shown to be a paresis of either the superior or inferior rectus—this condition producing a relative divergence of the eyes not because there was innervational incapacity to converge, *i. e.*, any lack of co-ordination, but because one of the adductors of the eye (superior or inferior rectus), was weakened. The weakening in these cases may be and apparently was a rule mechanical, *i. e.*, consisted in a feebleness of the muscular fiber itself, probably dating from birth and due to nondevelopment.⁴

Nor is it always the case that the exophoria is abrogated by training the adduction in the way that Dr. Gould has described. In fact, in rather more than half the cases in which I have employed the method, (and, as before mentioned, I have been

Or, taking the 200 cases in which the diagnosis was assured, those of esophoria formed 19.5 per cent (37.0 if we include the cases of hyperesophoria), those of exophoria 21.5, (40.0 including the cases of hyperexophoria), and hyperphoria 43.0, (including 7.0 of hyperphoria uncomplicated by either esophoria or exophoria).

⁴See for full discussion of these cases a paper read by the author before the New York Academy of Medicine and printed in the *Archives of Ophthalmology* for April 1894. I will here add only to the statements there made the fact that I have observed several of additional cases since.

employing it for years), the exophoria was not relieved, although the adduction was carefully and persistently exercised until the patient could overcome prisms of even 50° or 60° , bases out. A transitory reduction of the exophoria, to be sure, is the regular result of training the adduction; but cases in which an abolition of the faculty tendency lasting for any length of time is effected are by no means so frequent.

The fact is that there is no single cureall for exophoria or for any other muscular anomaly. Some cases yield to training of the muscles; some (although comparatively few), to correction of the refractive error; some to tenotomy; and some, we must reluctantly admit, are incorrigible. It will no more do to apply one method of treatment to the relief of all cases than to apply any one method for the cure of dropsy. In the one case as in the other we must first ascertain the nature and cause of the underlying pathological condition, and then apply the method of treatment that is adapted to the state found. If, as sometimes happens in hypermetropia, we have a heterophoria due to an excess of accommodative effort, we shall overcome it by the use of the appropriate convex glasses. If there is a deviation associated with a deficiency of accommodative effort, we may relieve it by exercising the adduction in the way that Dr. Gould and many others before him have done. If we have a concomitant heterophoria (and we can diagnose a concomitant heterophoria just as well as we can a concomitant squint), we shall in general remedy the defect only by a tenotomy. If we find that we are dealing with a paretic heterophoria,⁵ our treatment will vary widely according to the cause underlying the paresis and the gravity of the effects which it produces. And so in any case, I hold that we are no longer justified in treating exophoria simply as such or hyperphoria as such, but must first find what the exophoria or hyperphoria means; must find, that is, whether it is spasm or paresis, accommodative strain or anatomical conditions that are the cause of the heterophoria; and having found this to apply then the appropriate remedy.

This subject of the treatment of heterophoria in general, however, opens up too wide a field for discussion here, and I will merely call attention to the class of cases in which I believe that

⁵ Cases of this sort are more frequent than is usually supposed. Thus out of 295 consecutive cases of muscular trouble of all sorts recorded in my case-books, sixty-two, or 21 per cent, were instances of paretic squint or of a heterophoria produced by paresis of one of the elevator or depressor muscles; and of 269 persons examined for muscular anomalies fifty-six, or 21 per cent were affected with paretic heterophoria.

exercise of the convergence is indicated. It seems to me that they are for the most part, if not altogether, limited to those cases in which from some cause or other the patient is unable to disassociate his convergence and accommodation. That is, he cannot converge, even to a slight degree, without also accommodating, and hence he finds difficulty in overcoming prisms, base out, at a distance, because in looking at a distant object he cannot employ his accommodation and at the same time see distinctly. When we first practice the convergence in such a patient, we find that at first he can scarcely overcome a prism of 10° , base out. When finally we have succeeded in getting him to overcome prisms of 15° or 20° , we discover that his vision with these glasses is only $\frac{2}{40}$ or $\frac{2}{50}$, but immediately becomes $\frac{2}{20}$ on adding, say a — 1.50 D. spherical. Now if we keep up the practice for a day or two more, we soon find that he can be got to overcome prisms of 20° , 30° or more; and, although at first he sees badly with these glasses, showing that he is still using his accommodation when converging, the time comes when even with these strong prisms he gets a vision of $\frac{2}{20}$. We have now succeeded in divorcing his accommodation and convergence, so that the latter can be called into play at will without necessarily involving the former. When this has taken place we frequently find that the exophoria and the symptoms of which it is the cause have diminished or disappeared altogether. The reason is plain. The patient has now learned to converge, *i. e.*, to use his interni efficiently in overcoming his exophoria, without at the same time using any excess of accommodation in the effort, and hence he can see distinctly and yet at the same time fix properly with both eyes. That is, the exophoria or tendency to deviate may still be present, but we have shown the patient how to use his interni so as to overcome it all the time, and that moreover with facility and without interfering with his vision. The amount of actual muscular effort implied in this is not so great but that the patient can exert it continuously, and once the facility is acquired, he has no more trouble in exerting this effort than a person with 12 D. of available accommodation has in overcoming a hypermetropia of 0.50 D. The power to do this was there all the time but the patient's ability to use it was hampered by his inability to exert this power without at the same time using his accommodation. As soon as we have taught him how to employ one without calling the other into play, he will be able to converge as well as anybody and to overcome his exophoria with ease.

A careful study of the cases in which training of the adduction has sufficed to overcome the exophoria will, I believe, demonstrate that the efficacy of the treatment is explainable upon the principle laid down in the foregoing paragraph, and the same principle defines the limitations of a method which, though very serviceable, is far from being of universal application.

25 East Thirty-First street.

SOME TYPICAL CASES OF SUBNORMAL
ACCOMMODATIVE POWER.BY SAMUEL THEOBALD, M. D.,
OF BALTIMORE, MD.OPHTHALMIC AND AURAL SURGEON TO THE JOHNS HOPKINS HOSPITAL AND
TO THE BALTIMORE EYE, EAR AND THROAT CHARITY HOSPITAL.

THREE years ago, in a paper read before the American Ophthalmological Society, I endeavored to show that a not infrequent cause of asthenopia in young persons, by which was meant persons under the presbyopic age, is a condition for which I suggested the name "subnormal accommodative power." Whether this condition is due to a feeble, poorly developed ciliary muscle or an inelastic, unresponsive lens, I did not then, nor do I now, feel competent to determine. Either of these conditions seems adequate to explain the phenomena observed, and it appears probable that sometimes one and sometimes the other may be the efficient cause. Rules were laid down for the detection of this anomaly and for its correction by means of glasses, and several illustrative cases were related.

In the interval which has elapsed since the presentation of this paper these rules have been my constant guide in dealing with similar cases, and I have had many opportunities of testing their practical value and trustworthiness, and I may add that the additional experience thus gained has but served to convince me that the condition to which I called attention is one which the practical ophthalmologist can not afford to ignore.

As to the frequency of its occurrence, I may state that recently, in tabulating 1,615 consecutive cases of refraction and muscular anomalies met with in private practice since this condition first attracted my attention, I found that the presence of subnormal accommodative power, more or less marked, was noted 155 times, or in about $9\frac{1}{2}\%$ of the total number of cases.

The whole doctrine of subnormal accommodative power, as explained in my previous paper, is based upon the observation that, while the normal balance of the lateral muscles of the eyes, as shown by the vertical diplopia test is, in distant vision, one of orthophoria, in near vision, (at the usual reading distance) the

normal position is exophoria, the relative divergence amounting, as a rule, to from 3° to 5° . In other words, with induced vertical diplopia the *true* orthophoria at the reading distance is exophoria, and orthophoria (using the term as it is commonly employed) when it exists in near vision (with vertical diplopia) is a departure from the normal. Expressed in another form, the vertical diplopia test at the reading distance, with normal eyes, should show, as compared with the result at 20', a difference in favor of the external recti muscles of from 3° to 5° . When this is not the case, as set forth in the paper to which I have referred, subnormal accommodative power exists.

As might be supposed, subnormal accommodative power may exist apart from, or be associated with, refractive errors. I have met with it in emmetropic, hypermetropic, myopic and astigmatic eyes and also in association with other muscular anomalies. In glasses we have the means of remedying the defect. If emmetropia be present, convex glasses, for near vision, only are indicated. In hypermetropia stronger glasses for near vision than can be worn in distant vision may be called for, and in myopia weaker glasses must be prescribed for reading than would otherwise be given. The vertical diplopia test will afford us important indications as to the strength of the glasses which must be prescribed for near work. Whether convex or concave, they should be of such strength as to give, at least, the minimum amount of normal exophoria for the reading distance, say 2° to 3° .

Among the 155 cases referred to in which I have noted the presence of subnormal accommodative power a considerable number exhibited the condition in so slight a degree as not to make it of much clinical significance. From among the more marked cases I have selected the following as typical of the anomaly and illustrative of the measures adopted for its correction:

Case I. Miss G. T., aged 23, complained of asthenopia, severe and persistent headaches and poor near vision. She lived in the neighborhood of New York, and had received from a well-known oculist of that city astigmatic glasses $+ .25$ cyl. ax. 90° for each eye, from which she had derived little or no benefit. My tests did not reveal the presence of astigmatism, nor did they show even $.25$ D. of Hm. The ophthalmoscope showed marked negative symmetrical aberration of each eye, (a condition, it may be remarked, which I have found frequently associated with subnormal accommodative power), but indicated less than $.50$ D. of hypermetropia.

The vision of each eye was $-\frac{2}{15}$ and was somewhat variable, the left eye once getting all the letters of $\frac{2}{15}$. The vertical diplopia tests were also variable in their results at different sittings, but usually gave from 2° to 3° of esophoria at $20'$, and at $13''$ never gave less than 8° of esophoria and sometimes showed as much as 20° to 22° . The binocular near point for J. No. 1 was $9''$, at which distance it was read with much difficulty. With $+ 1.50$ S. there was still esophoria at $13''$ of $3'$, with $+ 2$. sph. orthophoria at that distance. Glasses, for near vision only, were prescribed, $+ 2$ sph. for each eye, centre out, 3 mm. They proved entirely satisfactory and gave complete relief, but after twelve months required to be changed to $+ 2.25$ sph. \odot prism $1'$, base out.

Case II. Mrs. A. C. S., aged about 26, mixed astigmatism, asthenopia, especially in near vision. With accommodation paralyzed by the liberal use of homatropin the full correction was: Left eye $-.25$ sph. $\odot + .37$ cyl. 90° ; right eye $-.25$ sph. $\odot + .50$ cyl. 90° . She had previously received from an oculist in Baltimore $-.50$ cyl. 180° for the left eye and $-.62$ cyl. 180° for the right eye, but had derived no relief from them. With her refractive error uncorrected the vertical diplopia test showed exophoria at $20'$ of $1\frac{1}{2}^\circ$, orthophoria at $13''$, indicating subnormal accommodative power of at least $3\frac{1}{2}^\circ$. Glasses were prescribed for distance corresponding with the total correction under homatropia, except that $-.37$ sph. was substituted for $-.25$ sph. In near vision, in order to obtain 2° of exophoria at $13''$, it was found necessary to add $+ 1.37$ sph. to the glasses decided upon for distance. For near vision, therefore, the following correction was ordered: Left eye $+ 1$. sph. $\odot + .37$ cyl. 90° ; right eye $+ 1$. sph. $\odot + .50$ cyl. 90° .

Case III. Mr. T. R. B., aged 19, a student at the Johns Hopkins University, had in left eye M. = 5. D.; in right eye M. = 5.50 D. with right hyperphoria $2\frac{1}{2}^\circ$ at $20'$.

A return of asthenopia compelled him to consult me a second time, in June, 1891. He had previously been wearing for far and near $-\frac{1}{16}$ sph. with upward decentering of right lens. With his M. half a diopter under-corrected, and with correction of his hyperphoria as follows: L. eye -4.50 sph.; R. eye -5 sph. \odot prism $2\frac{1}{2}^\circ$, base down; he had V. = $\frac{2}{5}$ — and orthophoria at $20'$, but at $13''$ the vertical diplopia test showed, with same correction esophoria of 13° , indicating a very marked degree of subnormal accommodative power. With the spherical correction reduced to -2.75 for L. eye, -3.25 for R. eye, leaving 2.25 D. of M. uncorrected, and reducing the tension of accommodation to almost nothing, the

vertical diplopia test gave at 13", 3° of *exophoria* instead of the previous 13° of *esophoria*.

As he had had no trouble with his old glasses in distant vision, and was satisfied with the acuteness of sight which they gave him, he was permitted to wear them still for distance, and the following correction was prescribed for near vision: L. eye — 2.50 sph. centre down, 3 mm. R. eye — 2.75 sph., centre up, 3 mm., and with these he was able to continue his studies with comfort.

Case IV. Mr. N. B. L., aged about 22, a student at the Johns Hopkins University, had Hm. 1.12 with V. = $\frac{20}{13}$. With glasses which merely corrected the Hm. asthenopia in near work persisted, or was relieved only temporarily. Owing to the presence of subnormal accommodative power, even with + 1.75 sph. orthophoria at 13" was shown by the vertical diplopia test, exophoria of but 1° with + 2.25 sph. and of 3° with + 2.50 sph. For near vision + 2.50 sph. and for distant vision + 1 sph. were prescribed, and worn with relief to the asthenopia, these same lenses, for greater convenience, being afterwards combined as bifocal lenticulars.

ON PARALYSIS OF THE OCULAR SYMPATHETIC NERVE-FIBERS.

BY H. GRADLE, M. D.,
OF CHICAGO.

SINCE Horner first called the attention of oculists in 1869 to the changes in and about the eye in consequence of disease of the cervical sympathetic nerve, a small number of authors have reported further cases. Judging from the scant literature the condition does not seem to be often seen by oculists, perhaps a little more frequently by neurologists. Many text-books do not allude to the clinical group of symptoms; others, for instance Michael,¹ and Fuchs² give a short description. An excellent account is given by Noyes in the latest edition of his text-book (1894, p. 436 and 469), who also quotes the older literature very fully. The more recent cases reported by Nieden,³ Lewinski,⁴ Samelsohn,⁵ Adamueck,⁶ Gruening,⁷ and Noyes⁸ agree as to the classical symptoms first observed by Bernard after division of the sympathetic of the neck in animals.

Slight narrowing of the aperture of the lids due to the relaxation of Mueller's unstriated muscular fibers in the upper and lower lid, slight pupillary contraction and increased vascularity of either the skin of the lids, the palpebral or the ocular conjunctiva, or of all three regions together have been observed in all the instances. Congestion of the retinal vessels was seen in some, but not in all cases. Retraction of the eyeball into the orbit as seen in the dog and cat after section of the sympathetic was, as a rule, not observed in man. Whenever any subjective annoyance was felt it was a feeling of slight irritation due to the increased vascularity. Most of the patients had congestion and increased perspiration on

¹ Diseases of the lids in Graefe und Saemisch's Handbuch d. ges. Augenheilkunde.

² Diseases of the eye. Eng. transl., 1894.

³ *Centralblatt f. Augenheilkunde*, 1884, p. 153, and 1885, p. 321.

⁴ *C. f. A.*, 1885, p. 517.

⁵ *Deutsche med. Wochenschrift*, 1888, No. 46.

⁶ *Centralbl. f. A.*, 1889, p. 426.

⁷ *New York Eye and Ear Infirmary Reports*, Jan. 1893.

⁸ Diseases of the eye, 1894, p. 469.

the same side of the face as evidence of paralysis of the vasomotor fibers of the sympathetic nerves. But the latter fibers were not involved in all cases. Indeed, Bernard has shown that between the spinal origin and the inferior cervical ganglion the ocular and the vasomotor fibers are anatomically separate and distinct.

It has been claimed by Morat⁹ and Doyon that the sympathetic nerve exerts an inhibitory influence on the ciliary muscle and constitutes thus the antagonist of the third nerve in the function of accommodation. They observed the reflection of a light from the anterior surface of the lens in dogs during stimulation of the sympathetic in the neck, and claimed to have seen the image increase in size, especially while an accommodative effort had been maintained by eserine. The observations could not be confirmed by the use of more exact measuring methods in the hands of Jcssop,¹⁰ Langley¹¹ and Anderson, and Heese.¹² Morat and Doyon also try to prove their view by reference to clinical cases of Jany (1874), and Schliephake (1876), in which the symptoms of paralysis of the cervical sympathetic nerve were accompanied by spasm of the accommodation while in two observations by Eulenburg (1869 and 1873), evidences of sympathetic irritation coincided with paresis of the accommodation. Neither any of the other reported cases nor my own support the view that the sympathetic nerve influences the accommodative mechanism.

The cause of the disease of the cervical sympathetic nerve was given in some of the reported cases as tumors or enlarged glands in the region of the neck, wounds implicating the nerve and a few times aneurysm of one of the large arteries. In most instances, like my own, no lesion could be discovered as the cause of the nerve disease. With the exception of the oldest case reported by Willebrandt in the first number of Von Graefe's *Archiv. f. Ophth.*, 1854, in which cervical glands shrank under the use of iodide of potassium, the disturbance has been always of a permanent character and was not influenced by treatment. With no prospect in view I have hence not attempted any treatment in my cases. As far as can be learned from the published histories, as well as the cases observed by myself, paralysis of the cervical sympathetic nerve is neither the precursor of further nervous trouble, nor does it lead to any secondary changes.

⁹ *Archives de Physiol. norm. et path.*, 1891, p. 507.

¹⁰ Bericht über den vii. Internat. Ophthal. Congress, 1888, p. 188.

¹¹ *Journ. of Physiology*, xiii., p. 554.

¹² *Arch. f. d. ges. Physiologie*, Bd. 52, p. 535.

Accident has permitted me to see within a short time three instances of sympathetic paresis, of which the following are the essential histories:

I. Mr. H., aged 19. January 31, 1893. Nine years ago had follicular conjunctival catarrh in both eyes. Since that time he has not complained until last year when his eyes gave him some discomfort for a short time. From this he has recovered, but he has noticed that the right eye is generally less open than the left; that it is sometimes somewhat bloodshot and that while in the wind he has to wipe his right eye more than the left. His health is perfect.

The left eye is normal in every way. The right eye is slightly more covered by both upper and lower lids than the left. The movements of the lids are normal, but they can not be separated quite as widely as on the other side. The skin of the lids is a trifle more red than left. There is also more vascularity of the conjunctiva of the lids than left, and the color of the sclera is not as pure a white as in the other eye. The pupil is a trifle narrower than the left one, but its mobility is normal. Vision normal, and ametropia like in the right eye. Ophthalmoscopically both eyes are normal and alike.

In short, the right eye showed an appearance as if irritated. As no cause could be found to account for this condition, either locally or in the nose or in any other lesion which could affect the sympathetic nerve, I searched whether the trouble might not be due to closure of the lachrymal duct, since he stated that his right eye watered more easily than the left. I found that a Bowman probe No. 1 could be introduced through the (dilated) entrance only with much difficulty, but by making the probe the cathode of an electric current (four milliamperes), I succeeded in passing it.

By passing the electrolytic probe at intervals of four to six days several times the overflow of tears was stopped. But the condition of the eye did not change. I saw the young man repeatedly during the next few months and found slight variation in the fullness of the vessels, in the drooping of the lid, and the pupillary contraction at different occasions, but the symptoms, as a whole, remained permanent. At no time was there any difference in the vascularity or the perspiration of the two sides of the face.

II. Mr. L. K., aged 48. November 28, 1893. Had good health until this summer, and has never had syphilis. About June he began to suffer from a steady but not severe diffuse headache of the left side of the head. This has ceased since the last six weeks. During the three or four summer months he felt weak without

being actually sick, and his weight ran down from 210 to 185 pounds. The past month he has been regaining his strength and has ceased losing weight. He has had very little medical treatment, and no diagnosis was ever stated to him.

Since his sickness his eyes have begun to feel weak on reading. His left eye, however, feels continuously *irritated*, but without real pain. It is often bloodshot and appears smaller than the right eye, especially when he is excited. He also thinks his sight is not quite as satisfactory left as right.

The patient is now in apparently good health and free from any pain. His urine was found to be normal. The lids on the left side are a trifle narrower than on the right. The palpebral skin is also more vascular. The conjunctiva is equally pale in both eyes, but the scleral veins are more conspicuous on the surface of the left eye. The left pupil is smaller than its mate, but its mobility is normal. The ophthalmoscope shows no difference between the two eyes. R. E., V. $\frac{20}{60}$ with C. — 1.25 ax. $90^\circ = \frac{20}{25}$; L. E., V. $\frac{20}{45}$ with C. — 1.25 ax. $90^\circ = \frac{20}{25}$. He can accommodate up to 20" with either eye, and accepts for reading sph. + 1 in addition to the cylinders. The increased vascularity is noticeable on the auricle as well on the lids of the left side. No anomaly can be found in the neck over the course of the sympathetic nerve. The patient was given appropriate glasses, C. — 1.25, ax. 90° for distance; C. + 1.25 ax. 180° for reading, and a trial of antipyrin in two daily doses of 1.00 was advised.

Two days later he reported that he was satisfied with his glasses, but the objective conditions were unchanged.

III. Mrs. K. April 24, 1894. A healthy lady, aged 32, came on account of inability to keep the right eye open as wide as the left. Since two years the right upper lid has been drooping, especially when she is tired. Steady use of the eyes gives her a somewhat tired feeling in both. She complains also of attacks of hemicrania mostly right-sided, but sometimes also left, which within the last two years have increased in frequency up to one or two attacks per week.

The right lids cannot be opened as far as on the left side. The edge of the upper lid is slightly more vascular right than left, otherwise no increased injection is noticeable. The two pupils are about alike. Ophthalmoscopically both eyes are normal. With the ophthalmometer I found As. 0.75 in R. E. and 0.50 in L. E. against the rule, but subjectively I could not determine any astigmatism with certainty. Her vision was $\frac{20}{30}$ in either eye, and

she could accommodate up to seven inches. For reading she accepted $+ 0.75$ D. Neither that day nor on subsequent occasions was there any difference in the appearance of the two sides of the face.

The next day I used homatropin. The evidences of paresis of the sympathetic fibers were much more marked than the previous day. The eye was more covered by the lids, the skin of the lids was reddened, and the right pupil decidedly smaller than the left. The right pupil yielded more slowly to homatropin than did the left, but ultimately both were equally dilated. With the wide pupil, however, no satisfactory determination of the refraction was possible. She refused anything over one-half dioptry, cylinder or spherical, but below that limit her answers were contradictory.

Five days later the symptoms of sympathetic paralysis were again less pronounced than at the last examination, but more so than when seen the first time. They evidently fluctuated with the condition of her nervous system. At this examination the right eye accepted a plus cylinder of 0.5 D., (axis vertical), with decided certainty, while the left was very slightly benefitted by a 0.25 cylinder. On account of the migraine I prescribed these glasses which seemed comforting to the patient, and directed them to be worn continuously. She reported eight weeks later that she had been free from headache since she got the glasses, except during the menstrual period. The evidences of disease of the sympathetic nerve were unchanged, but the vasomotor fibers of the face were at no time involved.

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WHEN AND HOW SHALL WE CORRECT FAULTY
EQUILIBRIUM OF THE OCULAR MUSCLES.BY EDWARD J. BERNSTEIN, M. D.
OF BALTIMORE, MD.

ABOUT four or five years ago Dr. Stevens, of New York, created a great stir in the ophthalmological world by his advocacy of a system of graduated tenotomy. Like many others, I took a deep interest in his writings. Just then I was preparing to go abroad for study, and whenever an opportunity presented itself I questioned the surgeons whom I met in regard to this. Almost to a man, every French, German or Austrian oculist ridiculed the measure as an absurdity. And to any one who has observed the absolute lack of result, in operations for strabismus, until *every* fiber of the faulty tendon is severed; this criticism appeals.

I may here say, while I am not willing to abide by the dictum of our German confreres in matters of refraction as applied to American patients. I think I am safe in saying their opinion on matters surgical are universally respected and accepted. Even at Moorfields, where the study of refraction has reached such a high standard, I could not find one of the gentleman there who gave the least credence to any permanency of result from the operation of graduated tenotomy, nor indeed was there any particular stress laid upon the detection and correction of faulty muscular equilibrium as that question is comprehended here in America.

Thus it is that my own experience with this subject has been limited to the past eighteen months and to my own private practice. No doubt most of us would have answered my questions had I put them three or four years ago as Dr. Stevens suggested; to-day, I very much doubt if many seriously consider it a remedial agent.

During the course of this paper I shall refer to the various methods which the larger study of this subject have called forth.

Let me start out by saying that the more I study this subject the more I am convinced that every case must be considered individually and that each is a law unto itself.

Any attempt at wholesale dealings with this, as with any other defect, cannot be considered worthy of emulation. I am reminded here of an axiom of a very careful teacher and surgeon. "Beware

of the man with one remedy and one instrument for all cases." One is struck, in view of this, by the uniformity of good results a certain gentleman reports, whose wonderful success as obtained from the almost universal need for $\frac{1}{4}^{\circ}$ prism in hypophoria was, to say the least, truly marvelous. To be generous we are forced to believe him singularly fortunate or else to be riding a big hobby.

I have ordered $\frac{1}{4}^{\circ}$ prism in hypophoria *but once*, and then my patient carried the prescription in his pocket for some time, and on his next visit, on an entirely different errand, I found that his old spherical glasses were giving him every comfort though the former hypophoria still existed.

It was my lack of any definite knowledge of heterophoria which I must thank for my conservative dealing. I am happy to see my own conclusions are those now held by numerous workers on the subject.

In a paper before the Am. Ophth. Soc. Dr. Murrell,¹ of Little Rock, Ark., speaks of the relative frequency of faulty equilibrium and the rarity of annoyance from them after ametropia was corrected. He found a large percentage to show lateral deviations of a few degrees which were physiological.

Repeated tests show *these* even to be variable. By putting accommodation in obedience we may convert an esophoria apparent or an orthophoria real into an exophoria. Heterophoria are most frequently annoying in the *neurotic* individual.

Dr. Stevens claims instability of lateral balance being at one time exophoria, at another esophoria, to indicate *invariably* hyperphoria. This is a very valuable suggestion but I doubt its invariability.

We know that vertical deviations are the most distressing and can readily understand how they may so destroy equilibrium of the eyes as to give rise to variable esophoria and exophoria, but they are not the only conditions. In fact, hyperphoria seems sometimes to be an after production of esophoria or exophoria, and correcting the latter by an operation will very largely remedy the former. If prisms are at all accepted, Dr. Murrell corrects the total hypophoria, *over* one-half of the exophoria and *less* than one-half of esophoria. Others correct one-half of the hypophoria and from one-quarter to one-half the exophoria or esophoria. (Dr. A. E. Prince.)

Dr. G. C. Savage distinguishes between a true esophoria dependent on natural structure of the muscle or its attachment,

¹ Journal Am. Med. Assoc., Oct. 28, 1893.

and pseudo-esophoria dependent upon the relationship between the centers of accommodation and convergence. He likewise distinguishes two forms of exophoria. His method of correction is by an adaptation of muscular gymnastics as applied to the larger muscles, namely by an alternate contraction and relaxation of muscular effort. This he accomplishes by placing before the eye a weak prism which slightly exaggerates the trouble, asking the patient to gaze through this glass, alternately at an object held at the reading distance (25 to 33 cm.), then at an object at 6 m., then raising the glass and looking at infinity without it, each step requiring five seconds. The patient has two seances per day of ten minutes each.

The prisms are gradually increased in strength after five days use of each combination until a certain prism is reached (4° to 8° each eye), which the patient now uses till cure is established. If the patient be myopic a part of his exophoria, and in some cases, the whole of it will be overcome by a full correction of myopia; whereas, in hyperopia a full correction or a partial correction will make the patient worse by adding a pseudo-exophoria to his true exophoria.

While speaking of muscular troubles I wish to refer to the excellent paper of Dr. Theobald on "Subnormal Accommodative Power." While it may be familiar to most of us, a repetition of "the most salient points may not go amiss." There is a condition in young persons which is as capable of producing asthenopia as insufficiency of the externæ muscles which we may term "insufficiency of the ciliary muscles." This may occur in conjunction with ametropia and heterophoria. Its existence is not to be determined by Jaeger's types, the smallest of which are usually read with facility. The parallelism, of which we ordinarily speak, between convergence and accommodation, is not as absolute as one would expect. For, if by means of a prism (4° for D. and 7° for N.), vertical diplopia be induced, we shall find *in accommodation for near objects* this parallelism is not maintained. A relative divergence occurs, so that the eyes accommodate for a nearer point than they converge for. In emmetropic persons below the presbyopic age, and with normal muscular balance it seldom falls below 3° and is not apt to exceed 5° or 6° . This relative divergence occurs only in N. V. and is entirely normal and should not be mistaken for a true exophoria.

In normal eyes there should be orthophoria for D. V. and exophoria of 3° to 6° N. V. under the above test. If there be more

than 6° or less than 3° at reading distance there is ground for suspecting some abnormality of muscular or refractive condition. If an excess: Insufficiency of the internal recti, hyperesthesia of the ciliary muscles and myopia suggest themselves. In myopia the relative divergence is excessive because there is little or no tension of accommodation, for this means, of course, that, owing to the correlation of the two functions, the interni are but feebly stimulated to contraction.

When the ciliary muscles are abnormally strong or the internal recti weak the same result happens, because in the first instance the exceptionally strong ciliary muscles require but a feeble nervous stimulus to enable them to perform their work, and this is accompanied by a correspondingly feeble stimulus to the interni; and in the second instance the weak interni receive only the stimulus which attend the ordinary accommodative effort, whereas, something more is needed than is the case for normal muscles.

If less than the normal amount of exophoria be present it denotes insufficiency of the ciliary muscles or subnormal accommodative power so that orthophoria for D. V. and near or only 1° or 2° exophoria, for the latter is to be regarded as conclusive proof of subnormal accommodatory power. His rule then is whatever the muscular balance may be in D. V., the vertical diplopic test at 6 m. should show a difference in favor of the internal recti as compared with the test at 33 cm. of at least 3° and generally 4° to 5°.

For example, if asthenope has esophoria of 2° at 6 m. in normal accommodation, we should find an exophoria of 1° or possibly 2° or 3°; again if distance test gives an exophoria of 3°, the near test should give 6° or 9° exophoria.

If, however, one has as much esophoria for near as for distant (and *a fortiori* if one has more), or in case there be as little or less exophoria at near as at distant test, we would conclude there was subnormal accommodation. To correct this, ascertain by trial the weakest convex glass (spherical) which gives the normal exophoria (2° to 3°) at 33 cm., and order this glass for N. V. Should the glass bring the binocular punctum remotum too close to the eye, try to overcome this difficulty by decentering the spherical glass outward as much as possible. Thus bringing over-action of internal recti and at the same time lessen the work of the weak ciliary muscles.

This is a very valuable hint and will often aid us to effectually dispose of a certain class of cases.

I wish to call attention here to the very valuable paper of Dr.

Edward Jackson² on the prismatic effect of the decentering of spherical lenses.

In a very recent article on exophoria, Dr. George M. Gould³ makes a very strong plea in favor of gymnastic exercise, differing from that of Dr. Savage in that he tests in exophoria the adducting power of the interni at 6 m. and requires the patient to alternately look through prismatic glasses, base out, double the strength of their maximum adducting power, *i. e.*, of only 10^{Δ} prisms can be overcome, he places two prisms each of 10^{Δ} , base out, in the spectacle fronts for the practice, the patient first looking at an object near at hand which is gradually withdrawn to 6 m.—the patient fixing object all the time.

He places the necessity for prisms or gymnastic exercise on this power of adduction or abduction of a certain amount of prismatic interference; however much I like his method of muscular exercise I cannot agree with him in his selection of cases justifying this measure. According to him one should have a power of adduction of 30° to 35° and abduction of 6° or 8° , and a manifest exophoria of 6° or 8° for D. V. In the other place he says a proportion of about 4° or 5° to 1 and an esophoria at twenty feet of from $\frac{1}{2}$ to 4^{Δ} or even 5^{Δ} , I call normality.

Surely this is margin enough to satisfy the least exacting; from a manifest exophoria of 6° to 8° to an esophoria of 5^{Δ} for normal. Dr. Theobald holds that orthophoria for D. V. and an exophoria of 3° to 5° for near, to be normal.

In my humble opinion that amount of heterophoria and just that amount is normal which leaves the individual no asthenopia after his ametropia is fully corrected, and attention to his general condition, not overlooking such organs as are known to cause reflex asthenopia has been given. I have seen as low as 2 exophoria or esophoria, (and nearly always that amount of hypophoria), require prismatic correction, and I have also seen exceptionally high degrees of all manner of heterophoria be totally disregarded after ametropia was corrected. I shall cite a few cases in a moment to show on what I base this assertion. As to the necessary ability to overcome a given amount of abduction or adduction in order to be free from troublesome heterophoria, it strikes me our knowledge is still too crude for any fixed rules. In my own person I have repeatedly tested my own powers and I find that I have an exophoria which varies, according to whether I am in condition or

² Trans. Am. Ophth. Soc., 1889.

³ Annals of Ophthalmology and Otology, January, 1894.

fatigued, from 2 to 5°, and I can not overcome more than a prism of 9°, base in. or a 10° prism, base out. I have V. $\frac{6}{5}$ and can read indefinite periods without fatigue. This is not exceptional. I have tested it in others who did not complain of asthenopia. To determine heterophoria in the distance I place the patient 7 m. from the small flame of the Argand burner, which (burner) is directly in the center of a black board on which I have drawn white lines 6 cm. apart in the vertical and horizontal directions. The *room is darkened* and before one eye a ruby glass is placed, before the other a Maddox bar. The patient now looks at the light with both eyes. With the red glass he sees a red flame directly in the center of the board, with the other eye he sees a white indistinct bar of light, and the number of lines apart these two images are seen indicates in prism diopters the amount of deviation and thus the amount of heterophoria expressed in prisms necessary to correct the defect. The *side* to which the line of light is thrown indicates the *kind* of heterophoria.

I do not find the least difficulty in obtaining accurate knowledge from the most obtuse or nervous patient by this method.

I tried for a short time the + 20 D. spherical lens behind a perforated disc, (as suggested by Dr. Stevens), but I found this too unsatisfactory as the slightest jar the patient received or your own inability to accurately place the lens, would call forth (according to this), insufficiencies oblique recti or what you would. It is beautiful in theory, but faulty indeed in practice. As I said before, I do not rely on the power possessed by the individual as expressed by his ability to overcome prisms. This power is largely one of education.

“I do not deny the possibility of the existence of a positive weakness of the interni that will give a separation of the double images in convergence, which is not apparent at the test at infinity, but I think such a condition must be rare.”⁴

Now as to the necessity for operations, this, it seems to me is indeed a rare one; still there are cases beyond any help other than complete tenotomy.

As for graduated tenotomies, Dr. Roosa, Dr. A. E. Davis, (*N. Y. Med. Journal*, October 8, 1892), among a host of others, have long placed no reliance in the method.

Dr. F. W. Marlow⁵ says: “I have several times seen a tenotomy which fully or slightly over-corrects a deviation at the time of the

⁴ Dr. S. M. Burnett. *Med. News*, February 6, 1892.

⁵ *N. Y. Med. Journal*, June, 1892.

operation, followed in a few days (and before the contraction of the cicatrix could have taken place), by a manifest error equal, or nearly equal to the original error. But to show that partial tenotomy can effect a permanent change in the position of rest he cites a few cases. I would ask anyone interested to read the history of these cases and see whether he would deduce a like conclusion.

In 150 cases of refraction every one of which I examined for muscular balances in whom only fifty had orthophoria. I have found it necessary to correct heterophoria after ametropia was fully corrected in but fifteen cases.

In five *additional* cases heterophoria continued to be annoying after the focal error was overcome and only ceased to annoy when the nasal causes had been abolished. (See *Med. News*, 1893).

Seven required correction for various grades of exophoria by prismatic lenses.

Four for hypophoria and three for esophoria.

One only resisted every means but complete tenotomy of the superior rectus of one eye and the inferior rectus of the other for a hypophoria of high degree.

Among the really marvellous degrees of heterophoria which patients will entirely disregard, I relate the following:

Case 1. Mr. I. L. M. complained of diplopia and asthenopia which was particularly annoying; V., R. E. $\frac{6}{9}$; V., L. E. $\frac{6}{9}$. Under mydriasis his ametropia was found to be: R. E. $+ 0.50$ D. cyl. ax. 15° nasal $= \frac{6}{6}$; L. E. $+ 0.50$ D. cyl. ax. 15° temp. $= \frac{6}{6}$. He has a hypophoria of $\frac{1}{2}$ in the right eye and an esophoria of 24° (twenty-four). I corrected only the astigmatism, leaving the external recti alone as at that time (sixteen months ago), I felt too insecure in my knowledge of muscular troubles, and I knew I could have the patient under observation whenever I wanted him, and if I found it necessary could institute what measures I saw fit later on. The patient was apprised of his trouble and expressed a willingness to submit to operation if I saw fit. The occasion has not yet arisen though I can still make out 14° esophoria.

Case 2. February 20, 1893. Mr. Dan F., aged 33, has just recovered from an attack of typhoid fever and now suffers from headache and diplopia when he reads his music. Refractive error was R. E. $+ 0.75$ D. cyl. ax. Vert.; L. E. $+ 0.50$ D. cyl. ax. 45° nasal. Has esophoria of 14° . Cylinders were ordered and general tonics in hope that the latter would overcome his loss of equilibrium.

April 21, 1894. He has gotten along splendidly with no trouble whatever. Merely came at my request. He has still esophoria of 14° .

Case 3. December 22, 1892. Mrs. K. was sent by her brother, a physician of this city, for asthenopia. She had mixed astigmatism, (which had not been corrected), which was corrected by R. E. $+ 1$ D. sph. $\ominus - 2$ D. cyl. ax. 80° , temp. $= \frac{6}{5}$; L. E. $+ 1.25$ D. sph. $\ominus - 2.25$ D. cyl. ax. 80° , nasal $= \frac{6}{5}$. Besides this she has a hypophoria of 4° which is uncorrected and gives no trouble.

Case 4. Mrs. W., the wife of a physician, had mixed astigmatism in L. E. and comp. hyper. astigmatism in R. E. in conjunction with 1° esophoria and a hypophoria of 7°. The ametropic correction gave full satisfaction, the patient reading with great comfort.

Case 5. January 15. 1894. Dr. A. S. A., V. $\frac{6}{5}$ each eye, (diplopia). Refraction emmetropic. Has an hypophoria of 5° in R. E. and an exophoria 7°. Notwithstanding the prevailing opinion I decided to correct the exophoria only. The patient wears 3° prism, base in, before each eye and has absolute comfort.

These are but examples; I could cite others but I would draw out unnecessarily this already too lengthy article.

In the face of these how can we talk of fixed rules?

In conclusion, let me again state that from what I can learn from my own rather limited experience and the writings of safe men is, that heterophorias are present in a large proportion of cases which seek our aid for asthenopia. In by far the greatest majority attention to ametropia will be all that is necessary to give perfect comfort, and it is this for which our counsel is sought; our patient cares very little whether he has an exophoria, esophoria or hypophoria, so long as it does not annoy him.

In a few cases prisms should be ordered for constant wear or possibly the gymnastic exercise may prove the better method, (on this I cannot yet venture an opinion, though it seems most rational). In a still smaller number, resort to complete tenotomy will be found the only means of cure.

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INSANITY FOLLOWING A MYDRIATIC—CAUSE OR COINCIDENCE?

BY LEWIS H. TAYLOR, M. D.,
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IN presenting the history of what was to me an interesting and anxious case I am led to put a part of the heading to my short paper in the form of a question, because it is by no means always easy to determine whether certain phenomena observed are to be regarded as effects following a cause, or merely as sequences which would have occurred with or without the supposed cause.

The ophthalmologist, as well as the general surgeon, is frequently brought face to face with profound mental disturbances following slight operations, and even so simple a procedure as the use of a mydriatic may in a highly nervous person produce, or at least be followed by, a train of symptoms at once perplexing to meet and difficult to manage. I have seen two cases of marked hysterical delirium following the use of duboisin, almost amounting to acute mania, but in a somewhat extended experience with the use of atropin in refraction work, I have never seen any ill effects follow its use, nor any nervous disturbance sufficient to call for other than a mere passing notice, except in the case I am about to relate:

Miss Mary M., aged 30, came to me October 23, 1890, at the suggestion of her physician, on account of severe headaches from which she had suffered for a long time. These were thought to be of malarial origin and she had been treated on this supposition for many months without avail. Vision at first examination was $\frac{8}{100}$ in each, while the ophthalmoscope showed myopia and myopic astigmatism. After making the usual tests of her eyes, and a trial of glasses without mydriatic, I gave her a four grain solution of atropin to be used three times daily, with instructions to return for tests for glasses. She came the next two days in succession and was tested without difficulty and without any special evidence of nervousness, selecting O. D. — 3. sph. \bigcirc — 1 cyl. ax. 180° and in O. S. — 2 sph. On the second day while sitting in my waiting room she began to talk in such an excited and incoherent manner that I was requested to see her immediately. Upon taking her into my private office I found her greatly excited and weeping over fancied trouble that she had caused myself and her friends at home. Her sister who was with her stated that she was well enough in the morning and entirely rational, but seemed somewhat excited and nervous before starting to my office. I gave her a sedative and sent her

home in my carriage, and called at her house later in the day. I found her semi-rational, but every now and then breaking out in fits of weeping which she could not control. This condition continued and a nurse was procured who watched her faithfully, and she also received careful medical attendance from her family physician, a gentleman of wide experience and great ability. Her trouble took the form of melancholia from which she did not rally, and after some months careful nursing and treatment it was decided to remove her to an asylum for the insane, where she still remains.

After the first outbreak I learned from her friends that she was the chief support and stay of her family, doing the work of the household far beyond her strength, as well as bearing the great mental strain of nursing her mother who for some years had been insane, and had been cared for at home until a very short time before the daughter's breakdown, when she had been removed to the same asylum in which the daughter was subsequently treated.

The patient came to me in reference to her eyes soon after her mother's removal to the asylum, because this was her first opportunity for the treatment which her physician had long recommended.

The question suggested is this—had the use of the mydriatic any influence in precipitating the attack of melancholia? We all know the profound impression occasionally produced on highly nervous individuals by so simple a procedure as the use of a mydriatic, and the oculist may sometimes be placed in an unpleasant position when such an effect occurs in an unreasonable or ignorant patient. In the case I have mentioned we must consider a highly nervous over-worked daughter of an insane mother, the daughter herself probably for months on the border-land of insanity, and liable to become insane in a short time without any special exciting cause, or to be mentally unbalanced from any sudden shock, either slight or severe.

A number of interesting cases of insanity following gynecological operations have been detailed by Dr. Thomas before the New York Academy of Medicine. Other cases following surgical operations, the use of anesthetics, etc., have been reported. The patient I have described could as well have been an example of the class described by Dr. Thomas had an operation been performed at the time the mydriatic was used.

I am inclined to think the use of the atropin merely a coincidence though I am not prepared to say that it did not have some influence as the exciting cause in precipitating the attack. I am happy to say that no blame was placed upon the oculist by the friends of the unfortunate lady, nor did they regard the treatment of the eyes as in any way the cause of her mental disturbance.

REPORT OF A CASE OF SUPPURATIVE DISEASE IN
THE MAXILLARY ANTRUM COMPLICATED WITH
ABSCESS OF THE LOWER EYELID AND
ATTENDED WITH SEPTICEMIA WITH
TWO ILLUSTRATIONS.¹

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E. S., aged 7, brought to me by her mother, March 10, 1894, on account of a very large swelling of the right lower eyelid, completely closing the eye and extending over cheek, which had existed for about ten days growing rapidly larger, despite the application of a salve ordered by the medical attendant. There was a history of "matter running from the nose" for several months before, when it partially ceased, and a few days later the swelling of the face appeared and the other symptoms set in. The child had a number of chills before coming to me and was evidently seriously ill.

Status Presens: The child dull and stupid; skin yellow; slight pustular eruption on the face and body; temperature 101°, higher in the evening, in fact all signs of beginning septicemia. Right cheek and lower eyelid greatly swollen, (see Figs. 1 and 2); pus distinctly present in the latter; pre-auricular and cervical glands swollen; the periosteum of the upper jaw on that side greatly swollen; the gums bleeding, and abscess in the roof of the mouth with much deep-seated pain over antrum.

The nasal passages were full of a muco-purulent discharge which, when cleared away by Seiler's solution, showed purulent rhinitis. The two molar teeth (milk), were decayed, although

¹Photographed by Sam'l French, M. D.

they had not given rise to any discomfort. The eyeball was normal in every respect. From these conditions suppurative disease of the maxillary antrum was diagnosed and the patient given quinin and sent to the Wisconsin general hospital.

Operation: March 11, Dr. F. E. Walbridge assisting. Chloroform anesthesia. The pus was evacuated from the lid abscess in the line of the intra-orbital fold so as to leave as small a scar as possible. An opening was made with the drill through the alveolar process of the upper jaw above the molar teeth and enlarged with a spoon. The bone was soft and mushy, coming away easily. But a few drops of pus were evacuated from the antrum as apparently it had mostly escaped from the opening in the cheek



(FIG. 1.)

(FIG. 2.)

from which about an ounce had been taken. (Communication of the two cavities was not, however, at any time clearly established). Dr. Walbridge extracted the loose teeth and I then washed out the abscess cavities with 1-5000 sublimate solution, injected peroxide of hydrogen and inserted catgut drain in the cheek, and iodoform gauze in the antral opening. Recovery from anesthetic uneventful, temperature normal the next day.

On the next day a free discharge of sanguinous pus came from the opening in the jaw, and as this was sufficiently large a rubber drainage tube was inserted. More pus had accumulated in the lower lid. A mouth wash of boric acid, nasal spray of Seiler's solution, and cod liver oil, and syrup of iodid of iron were ordered, under which, in connection with daily cleansing of the

two abscess cavities with 1-5000 sublimate solution and injection with peroxide, that of the lower lid healed in two weeks while the discharge persisted from the antrum for nearly six weeks, gradually diminishing until at the end of that period the opening was allowed to close, and since that time neither have recurred. The purulent rhinitis has been cured by the cleansing, and the child is now in good health. The incision in the lower eyelid left a very small scar adherent to the malar bone and there has been some distortion of the alveolar process which will eventually show in irregularity of the permanent teeth.

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THE HALO SYMPTOM IN GLAUCOMA.

BY S. O. RICHEY, M. D.,
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HALO is classed among the prodromata of glaucoma: it may occur later in the progress of primary simple glaucoma. Some subjects of glaucoma, more observant than others, mention it without suggestion from the physician. In many instances it is not noted, or little importance is attached to it. A few attempts have been made to explain it. DeWecker thinks it "due to very slight alterations in the epithelial layer of the cornea, produced by temporary increase of pressure." Wolfe suggests that it "may be owing to dilatation of the pupil, to change in the lens, or to disturbance in the circulation." Neither "disturbance of the circulation nor dilatation of the pupil," when they exist, under other circumstances, seem to cause the phenomenon.

"Alteration in the epithelial layer of the cornea," and "change in the lens" are phrases of vague significance, the exact meaning of which may be only surmised, except that Dr. deWecker qualifies his statement by the expression "is analogous to a similar phenomenon witnessed in most cases of conjunctival catarrh where there is irregular desquamation of the epithelium." In conjunctival catarrh this peculiarity is rather due to diffraction of rays of light by globules of secretion on the surface of the cornea, as it disappears when they are removed. Moreover, cocaine which disturbs the corneal epithelium *lessens* conjunctival secretion, and dilates the pupil, does not seem to produce the halo. Let it be further suggested that constant slight changes in the corneal epithelium are physiologically present *without* the phenomenon; therefore, we must look for some other explanation. Dabrowsky, of St. Petersburg (*Archiv. of Ophth.*, Vol. XV., p. 267, 1886) assumes that the glaucoma halo "depends upon irritation of the retina and optic nerve by hyperemia," in support of which he cites a personal experience while in a Russian bath. The rainbow rings became even more distinct when he entered a cooler room. He continues, "for the last few months I have constantly seen these rings around the lamplight in the evening. There is no noticeable increase of tension and the visual acuteness is $\frac{25}{30}$. Tension of accommodation always renders them (the rings) more

distinct. As the cause of glaucoma must be in action previous to increase of tension, or diminished acuteness of vision, and as the halo is a prodrome, Dr. Dabrowolsky's eyes must rest under suspicion of inherent tendency.

The halo is never constant, but appears and disappears to recur again, and with increasing frequency as the disease develops. At one time it may be a corona; at another, it appears in the shape of varicolored *sparks* of light. This intermittence and change of form would indicate that the cause is not persistent, that at times it lacks force, or distribution. Pressure *upon* the globe will produce a ring of colored light, or a luminous spot, always opposite to the point of pressure. The halo may be present in glaucoma with seeming normal intra-ocular tension, and may be absent during increased tension; gradual, steady pressure will not produce sparks of light. The cause of the halo would seem not to be in the retina itself, but in the media anterior to it. Its variability suggests the aqueous humor, or some surface subject to the influence of the aqueous humor, for it is in the *serum* of the blood that the chief deviation from the healthy standard is perceived, products of excretion which have not been eliminated. (Garrod).

The laws of nature are undeviating; the law of gravitation, terrestrial or celestial is the same; so with the law of light. The lunar halo is a familiar object, the cause of which does not exist in ourselves nor in the moon, but in the intervening media whose character changes. The Descartes theory of the encircling lunar halo was accepted by Marriotte, Dr. Thomas Young and Sir Isaac Newton, and remains to-day the unquestioned explanation.

According to Descartes, it is owing to the refraction and reflection of rays of light by minute snow and ice crystals in the upper strata of air, and occurs in the presence of the cirrus, or ice-cloud.

Professor Cleveland Abbe explains the arrangement of colors in a circle of 22° radius, the inner edge red, the outer edge blue, to be "light polarized in direction of tangent to circumference; it is formed by light passing through the alternate faces of hexagonal ice-crystals in the direction of minimum deviation through the base and sides of right prisms."

The prevailing arrangement of colors in the glaucomatous halo is red in the outer margin and bluish-green in the inner margin, the reverse of the lunar halo. ¹The difference in arrangement of

¹The transposition of the colors of the halo is very strong evidence that the cause of the halo in glaucoma is to be looked for posterior to the iris, in accordance with the disposition of rays of light passing through the aperture of a screen.

colors is owing to a difference in the position of the refracting crystals relative to the eye: in one case, posterior to the pupil; in the other, external to the eye.

“Sodic chlorid + urea forms shining rhombic prisms,” (Landois & Sterling Text-book on Physiology, second Am. edition, page 432). Acid sodic urate appears as a brick-red deposit, more rarely gray or white, in rheumatic or febrile conditions. Microscopically, it is completely amorphous, consisting of granules which sometimes have spines on them. The potash salt is the same. They are easily soluble in warm water. (Vid. *Suf.* page 435). As the menstrua cool they are precipitated.

When the urates in the blood are in excess (uric acidemia), the same influences which determine their presence in the synovial fluid of the joints and their precipitation upon the serous surfaces operate in the eye which is more exposed to vicissitudes of temperature. Hence, variation in glaucoma halo, with variation of urates in the blood, might clearly occur without present change of intra-ocular tension.

The glaucoma halo *might* “depend upon irritation of the retina and optic nerve,” not caused by simple hyperemia, but by precipitated urates; or, it may be due to the *presence* in the aqueous, or vitreous, humor of urates in the shape of rhombic prisms or amorphous granules (with or without spines), with power to cause diffraction of light. The prisms formed by sodic chlorid + urea at least have this faculty.

A CASE OF ORBITAL CELLULITIS FOLLOWING
TENOTOMY FOR SQUINT.BY CHARLES H. MAY, M. D.
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ALTHOUGH the text-books mention the occurrence of orbital cellulitis after operations upon the eye, this accident certainly must be rare after tenotomy when strict antiseptic precautions are observed. Perhaps it occurs oftener than the absence of published cases would lead us to believe: for naturally, even though the operator considers himself blameless, he is very apt to keep such cases quiet. Hence the following report is interesting. It gave the writer some anxiety. When the inflammation had been successfully combatted, a divergent squint was present as a result of the failure of the divided muscle to attach itself properly. Some atrophy of the optic nerve also resulted and produced some contraction of the visual field though no diminution of the acuteness of vision. A reddish mass appeared beneath the conjunctiva, at the seat of the tenotomy some time after the operation: this was excised and microscopical examination showed it to consist of granulation and muscle tissue. At the present time the eyes are perfectly straight and no damage has resulted.

M. R., a boy 6 years of age, was brought to my office for examination November 24, 1891. He had an alternating internal squint of about four lines; this had existed several years. V., O. D. $\frac{20}{30}$, O. S. $\frac{20}{40}$.

November 27. The parents having consented to a tenotomy, I divided the left internal rectus. Ether anesthesia. Full tenotomy. There was much more than the usual amount of hemorrhage, but otherwise nothing abnormal. The result of this operation was to diminish the squint but it soon became evident that a second tenotomy would have to be done.

January 13, 1892. Squint of two lines remaining, I operated upon the right internal rectus, again doing a full tenotomy. I observed the greatest care in regard to antisepsis. As is always my custom, I brought my own towels, napkins, porcelain dishes for instruments, and in fact, everything connected with the operation; the instruments had been boiled and were bright and polished. Ether anesthesia. I experienced the same troublesome hemorrhage which I had observed in operating upon the other eye, but beyond this, there was nothing unusual about the tenotomy. The patient complained of pain during the evening of the same day, and, according to directions I had left, iced compresses were applied for two hours.

January 14. Considerable swelling and redness of lids of operated eye. Marked tumefaction at the seat of the tenotomy. Prescribed a saturated solution of boric acid as an eye-wash, and continuation of cold compresses.

January 17. Lids swollen to such an extent that it was with difficulty that they could be separated sufficiently to obtain a view of the eyeball; they were reddened, edematous and skin covering them very tense. The eyeball was pushed forward and its motion limited. The discharge was serous with the addition of a very little pus which seemed to come from the seat of the operation. The patient complained of great pain; this was so severe that he was unable to sleep. Cornea clear and the deeper parts of the eyeball seemed normal as far as I could judge as the result of a very difficult examination. Temperature (mouth) 101.5, pulse 120. Examination showed that the conjunctival wound had not healed; I removed the two stitches; there was a slight sero-purulent discharge from this opening. The appearances all indicated the occurrence of *orbital cellulitis*, it was not merely a case of tenonitis. I ordered the cold compresses and boric acid solution to be discontinued, and substituted constant hot compresses and a wash of solution of corrosive sublimate 1 to 5,000; I also instilled atropin.

January 16. The symptoms became more marked. The lids were more tense and red and swollen; the exophthalmos more marked and the eyeball could scarcely be moved at all. There was now some purulent discharge from the conjunctival wound.

January 17. Condition the same. Dr. Knapp saw the case in consultation. Treatment the same. A thick pus was making its way through the wound; I enlarged the opening with a probe.

January 18. Condition the same, except that the discharge of

pus from the conjunctival wound is becoming more profuse, is thinner and escapes more readily. Pressure upon the upper lid increases this escape of pus. I concluded, therefore, that this opening would suffice for the discharge and did not incise the upper lid, especially since there was no portion which was more tender than the rest, and no indication of pointing.

January 19. Considerable improvement. There is a copious purulent discharge from the conjunctival wound. Less exophthalmos; the eyeball more movable; lids less tense. Temperature (mouth) 99.5, pulse 90. Continued same treatment.

January 20 to 24. All symptoms rapidly subsiding. Discontinued treatment.

February 2. Lids normal. Eyeball presents good motion in every direction except inward: here it is limited; still considerable purulent discharge from the conjunctival opening. Marked divergence of right eye. Examination with the ophthalmoscope shows optic neuritis of mild degree.

February 22. Discharge has ceased and conjunctival wound has healed.

April 16. Condition the same.

February 11, 1893. Divergent squint about half what it was. He had been wearing + 2.00 D., O. U. Ordered + 2.50 D., O. U. With these, vision is the same as before operation: O. D. $\frac{20}{30}$; O. S. $\frac{40}{40}$. Fairly marked optic nerve atrophy and some limitation of the field, O. D.

February 20, 1894. I had contemplated advancing the right internal rectus, but this was found unnecessary. There is now no trace of divergence; eyes are perfectly straight and motion is good in all directions. Vision, O. D. $\frac{20}{100}$; $\frac{20}{40}$ w. + 2.50 sph. \odot + O. .75 cyl. 30° n.; O. S. $\frac{20}{40}$; $\frac{20}{40}$ w. + 2.50 sph. \odot + 0.75 cyl. 30° n. A small reddish mass about the size of a large pea has existed over the usual insertion of the right internal rectus: this was excised: it consisted of granulation and muscle tissue.

This case has happily recovered without any damage, and the boy is cured of his squint and requires no further treatment. And now the question, which is of interest, arises: How did infection occur? For there is no doubt that the wound was infected. I believe I can exclude instruments, dressings and everything else connected with the operation, for such an accident has not occurred to me in several hundred cases of tenotomy and in many cases of advancement for squint, nor have I encountered it after any other operations upon the eye. I believe too that I can safely

exclude my assistant as a factor, for I am always careful to see that the assistant exercises the same care in cleansing his hands that I make use of. The only explanation which I have to offer is, that probably the infection occurred in some way when the cold compresses were applied by the family on the evening of the operation, when the boy complained of pain.

692 Madison Avenue.

SO-CALLED MUSCULAR ASTHENOPIA.

BY GEORGE W. HALE, M. D.

OF NASHVILLE, TENN.

THE term muscular asthenopia is an exceedingly vague one from an etiological standpoint. It may mean what its name would seem to imply and it may not. All writers acknowledge that an unbalanced condition of the extrinsic ocular muscle may be the cause of asthenopia.

Many seem to feel satisfied that they have solved the problem when they have given directions for determining the muscular balance, and if found at fault, have laid down rules for prescribing the appropriate prisms for the correction of the same, or have explained the use of prisms for gymnastic exercise, either with or without some form of tenotomy. Advancement of the apparently weak muscles is also advised and its technique described.

There are a few who seem to have had a vision at some time in their lives, which allowed them to look into the hidden workings of that mysterious organ, the brain. There they saw, or thought they saw, in the faulty action of the nerve centers which preside over the eye muscles, the cause of the trouble in a small per cent of the cases. Only one author speaks of it as a frequent cause. At that point they also appear to have been satisfied and have suggested little for its relief.

For several years I have had a growing conviction that the real cause of muscular asthenopia was in the abnormal action of the nerve centers. Now I feel certain that it is central, in a very large proportion of those so suffering. When I make that assertion I am not unmindful of the writings and teachings of those gentlemen who would have us believe that nearly all our ills in this world, are directly traceable to the fact, that one or more of our extrinsic eye muscles is stronger than its opponent, or else has an abnormal insertion.

It seems to me that Landolt is the only writer who has given us a good definition of the cause of muscular asthenopia. He says, "that it depends upon the absolute or relative weakness of the adductors or upon their insertion, or else has its origin in the *central organ*, and depends upon a disturbance of innervation or upon a weakness of the power of fusion."

While I consider the above to cover the whole ground, I would certainly make some transposition, so as to make it read something like this: Muscular asthenopia usually has its origin in the central organ, depending upon a disturbance of innervation, or possibly, in some cases, upon a weakness of the power of fusion. In a small per cent of cases it depends either upon the absolute or relative weakness of the adductors or obliques, or upon their insertion.

My own observation teaches me that want of converging power is the chief cause of this form of asthenopia. I cannot agree with those who have found insufficiency of the external recti to be a much more frequent cause. I also feel that if they will assume that disturbance of innervation is at the bottom of most of these cases, and work them out from that standpoint, they will find that many of their cases which they have supposed to be dependent upon weakness of the externi, will fall very naturally under the reverse head.

My reasons for believing that the cause is usually central, and not peripheral are these: They have been set forth by others, so I can only repeat. Make a patient, who is suffering from exophoria, converge to his nearest possible point, by that means putting all possible strain on the supposed weak interni. Now while his eyes are fixed on the near object, with his head held rigid, command him to follow the object, as you move it to one side or the other. You will observe that his eyes follow easily, no matter, as a rule, to which side you carry it. In one case, or the other, you have, providing he follows the object, put a much greater strain on one or the other interni, and it finds no difficulty in responding. How could it possibly do that, were it an actual weakness of the muscle?

Again, many hyperopes, either with or without astigmatism, who have exophoria, find their exophoria disappearing soon after their error of refraction is corrected.

Or what is quite as common, an exophia which is causing marked asthenopia to-day, while the eyes are being used for continuous near work, may have entirely disappeared a few weeks later, especially if the eyes are relieved of near work.

Once more: When esophoria is associated with hyperopia or hyperopic astigmatism, of low degree, and the adduction is weak, the esophoria and asthenopia will frequently disappear without correcting the error of refraction, simply by increasing the adduction.

The test of carrying the weighted convergence-stimulus to infinity, is to me, another convincing argument.

All the above facts seem to me to point to a central origin.

In order to better understand what we mean by disturbance of innervation, let us look a little more at the action of the eye muscles. We have been taught from all time that convergence and accommodation go hand in hand. On those premises did Donders base his theory of the production of convergent squint in the hyperope. Fortunately for him, nearly all those afflicted with convergent squint chanced to be hyperopic. Not till he struck a myope, who converged, did he find any trouble with the theory.

That convergence bears a certain relation to accommodation, is understood by all, but that that relation is fixed and unchangeable, is not by any means a certain thing; in fact, I believe the reverse to be the truth. If it were not so we should always have esophoria with every case of hyperopia, whereas the opposite, or exophoria, is quite as common. Now, if exophoria ever develops in an hyperope, one of several things must take place, either the interni becomes exhausted, from the continual stimulus which has been applied to them, through the constant tax on the accommodation, or there is a true weakness, or abnormal insertion, of one or both muscles, or else the relation, which we have been taught existed between those two functions has been changed. If either of the former were true, a few minutes appropriate exercise could not possibly restore to the weakened interni the needed strength. Such a result can, however, almost always be brought about in a few moments, and is just what we would expect on the latter hypothesis. The moment you can separate these two functions it seems to me that we must acknowledge that they are presided over by separate nervous centers, which in some mysterious manner act conjointly, but still admit of having that action changed. If that is true, and I firmly believe it to be, all our cases of muscular asthenopia, dependent upon exophoria, should be amenable to treatment.

That, from my point of observation, would do away with more than half our cases of muscular asthenopia at once.

The development of esophoria in cases of hyperopia might be explained on the theory of the relation between convergence and accommodation. That, however, does not explain them all, as many do not improve after correction of the hyperopia, which they theoretically should do, were the hyperopia the cause. So again we are driven to the conclusion that that relation is not fixed and unchangeable.

Now for modes of cure or relief, whichever you choose to call

it. It goes without saying, that all forms of ametropia should have accurately adjusted glasses. As to what portion of the error of refraction should be corrected, it is not the province of this paper to discuss only in the most general manner.

Where esophoria is associated with hyperopia or hyperopic astigmatism, the whole error should be corrected and glasses worn constantly. Where esophoria is associated with myopia or myopic astigmatism, it is also my belief, that the whole error should be corrected. If the esophoria still gives troublesome asthenopia, then some appropriate exercise for the relief of the former should be instituted.

Where exophoria is associated with hyperopia or hyperopic astigmatism, the whole error may or may not be corrected and glasses worn constantly, or only for the near, as each case may seem to dictate.

Where exophoria is associated with myopia or myopic astigmatism, the whole error should be corrected and glasses worn constantly. The preceding are the four great classes with which we have practically to deal. If we are able to meet and successfully relieve all the above conditions, only a very few of our patients will suffer much in our hands, or be obliged to seek relief elsewhere.

The remaining cases of hyperphoria, and unbalanced obliques which cause asthenopia, I believe to be few in number when compared with all who suffer from muscular asthenopia, and quite a portion of these two classes can be met successfully by one or more means, which we always have at our disposal.

If I am right in the theory, that most of the cases of muscular asthenopia are dependent upon a faulty innervation of the eye muscles, than any means which would so change that faulty innervation as to restore the apparent want of muscular balance should give our patients relief. As I have said before, prisms combined with the glass correcting the ametropia have been prescribed for years, and when they are a success, the patients consider them a great one, though of course they are nothing more than crutches. We all know how wonderfully comfortable and satisfactory prisms are on certain patients, and how completely they fail on others who are, in some respects, in a like condition.

The above is of easy explanation when you admit the central theory for most cases, and the muscular weakness or abnormal insertion for the few. On no other grounds is it so satisfactorily explained.

Prisms for exercise, either with or without tenotomies, are in certain cases and by certain men considered a "*sinequa non*," and I am willing to acknowledge, give relief, either temporary or permanent, in many cases, especially in the hands of wise and careful men.

While, as I have said, one may have fair success with prisms, tenotomies and exercise, providing he is judicious, and his patient is careful, painstaking and faithful; nevertheless, as soon as he admits the central origin of the trouble, he must abandon the application of all of the above, except in a few cases, or where he uses prisms for exercise, with the distinct idea that he is changing the innervation, and not strengthening the muscles.

In June, 1889, Dr. Deady of New York, read a paper before the American Institute of Homopathy in which he described the carrying of the weighted convergence-stimulus from the punctum proximum to infinity, for the relief of exophoria. As far as my observation goes, the most of writers, even Deady, supposed they were strengthening one of the extrinsic muscles. Not one supposed he was changing the innervation of these same muscles. While Dr. Deady, now nearly five years ago, spoke of carrying the weighted convergence-stimulus to infinity, it was reserved for Dr. Gould of Philadelphia, to put it in such a shape as to attract the notice of the profession at large.

I presume Dr. Gould's investigations were "*de novo*," and he deserves full credit for all he has done for suffering humanity, still priority must be conceded to Dr. Deady; I am, of course, speaking within my knowledge simply, some gentleman may have suggested it years ago. I can only say I never heard of it, prior to the article above referred to. The details of carrying the weighted convergence-stimulus to infinity for the relief of exophoria and its reversal, for the relief of esophoria, have been so fully described that it would be a piece of presumption on my part to repeat them here. I only wish to say a very few words concerning the cases to which they are applicable.

We all know that the tests for muscular equilibrium are very unreliable. They vary from day to day, or from hour to hour of the same day. We also know that many patients suffer from apparent muscular asthenopia, whose muscles appear to be in balance by equilibrium tests. I think Landolt has given us the explanation of such cases. His experiments seem to prove that in order for one to work easily at the near point, he must use only one-fourth, or at most, one-third of his positive convergence. The other three-fourths or two-thirds being held in reserve.

Now one may have position convergence enough to satisfy the equilibrium tests, but which is really so small in amount that it is practically all needed for near work, allowing none to be held in reverse. Such a person will, of course, show weak adduction, which should be brought up, no matter what the equilibrium tests may show. These cases are, I believe, very responsive to the convergence-stimulus exercise. Nearly all cases of exophoria respond equally as well to the same exercise.

In a word, I would say, that whenever the adduction is found weak, no matter what the state of abduction may be, the case is an appropriate one for the treatment referred to. If the adduction does not respond in a few weeks, you may have a true insufficiency and some surgical procedure may be instituted.

My observations as regards the application of the principles to esophoria have been limited, simply because I have not had enough cases to work on. The few which I have had have all responded well, but they are only four in number so they amount to nothing.

I have observed this: In many cases which show one or two degrees of esophoria, with weak abduction as well as adduction. That, as soon as you put them on the exercise for the weak adduction, the abduction commences to increase as well, so by the time the adduction has risen to 36° say, the abduction is up to about what may be considered normal, and all asthenopia has disappeared. Such cases I formally considered to be due to want of diverging power, but as they have all been getting well under exercise of adduction, I have been forced to change my opinion. The above probably accounted for the few cases of esophoria which I have encountered in the last six months.

I desire to present in a short and succinct manner the histories of a few cases which have fallen under my care of late. All errors of refraction corrected under a mydriatic.

Miss R., aged 16, had asthenopia for four years. Been under the care of many oculists. Error of refraction corrected: R. E. sph. + 0.50 \odot cyl. + 0.75 ax. 75 ; L. E. sph. + 1 \odot cyl. + 0.50 ax. 90 . Abduction 5 ; adduction 15 ; exophoria 1° in acc. 8 .

Has had tenotomies, various kinds of exercise with prisms; no relief, not even temporary.

On November 29, 1893, commenced exercise with innervation prisms. In three weeks abduction 7 ; adduction 32 . All asthenopia gone. Remained comfortable up to May 10th.

The patient had an apparent want of balance of the oblique which disappeared as soon as the adduction came up.

Miss S., aged 16, for five years has had asthenopia. Worn glasses con-

stantly all that time. R. E. sph. + 0.50 \bigcirc cyl. — 1.25 ax. 180 ; L. E. sph. + 0.50 \bigcirc cyl. — 2. ax. 180 . Abduction 7 ; adduction 15 ; equilibrium ; exophoria in acc. 12 ; no change in glasses.

On March 9, 1894, commenced exercise with innervation prisms. In two weeks abduction 8³ ; adduction 40 ; asthenopia gone. Only time will tell the final result.

Mrs. C., aged 40, had asthenopia for years. Tenotomy of left int. rectus five years ago. Since then has worn: R. E. sph. + 0.50 \bigcirc cyl. + 0.50 ax. 165 , \bigcirc prism 2 , base out; L. E. sph. + 0.25 \bigcirc cyl. + 0.75 ax. 15 .

February 1, 1894, first consulted me. Abduction 3 ; adduction 20 ; esophoria 10 ; in acc. 2 .

Allowed to retain the same lenses minus the prism. Innervation exercise commended.

On May 23d, esophoria 4 ; abduction 6 ; adduction 26 ; no asthenopia,

Mrs. K., aged 25, almost an invalid for years. Always has headache, scarcely able to use the eyes for any near work. Abduction 4 ; adduction 12 ; esophoria 1 ; exophoria in acc. 10 . Given for constant wear: R. E. cyl. + 0.50 ax. 135 ; L. E. cyl. + 0.25 ax. 45 .

March 13, 1894, commenced exercise of the interni. In four weeks abduction 6 ; adduction 38 .

All headache and asthenopia gone. Digestion improved; gaining flesh she thinks, though has not tested by weight. Expresses herself as being an entirely different person.

Mrs. P., aged 35, for nine years had asthenopia and headache. Always had dysmenorrhea; for twelve years menorrhagia and metrorrhagia as well. Seven years ago, was for six months in a private hospital for their treatment. No benefit. Always in bed from two to four days at menstrual period. Room dark, not able to use the eyes for anything.

Various lenses, either with or without prisms, have been worn for the last eighteen months. Benefit only temporary.

First seen February 14, 1894, just able to walk two blocks to my office. Equilibrium; exophoria in acc. 5 ; abduction 6 ; adduction 16 ; right hypophoria 5 .

Innervation prisms for increase of adduction, used three times a day on the 14th and 15th. Made her very ill first day, vomited quite a portion of night, but felt better on the 15th. Menstruation commenced during the night of the 15th and 16th, unattended by any pain, which she affirms is the first painless menstruation she has ever had. No photophobia. Up and about all the time. No menorrhagia or metrorrhagia, menstruation lasted five days in place of nine as has been usual for twelve years.

Innervation exercise continued daily. In six weeks abduction 6 ; adduction 38 ; right hypophoria 2 .

Given R. E. cyl. + 0.50 ax. 90 ; L. E. cyl. + 0.75 ax. 90 ; prism 1 , base up, as it was left superior rectus which was at fault, to be worn constantly. Second, third and fourth menstrual periods have been normal in every respect.

Little asthenopia or headache, unless she uses eyes excessively hard. I present this for what it may be worth, time will tell.

Miss B., aged 10, in April, 1893, adjusted these lenses. R. E. sph. — 5 \bigcirc cyl. — 2 ax. 10 ; L. E. cyl. — .75 ax. 10 ; abduction 6 ; adduction 10 ;

exophoria 3° in acc. 10°. Glasses gave some comfort for nearly a year, when they became almost useless, as headache and asthenopia seemed to be increased by them.

On April 19, 1894, consulted me again. Abduction 6°; adduction 10°. Under innervation prisms, in three days abduction rose to 12°; adduction to 32°, and glasses were worn more comfortable than ever. I understand this may not last.

Miss O., aged 20, had asthenopia and headache for several years. Been a patient of several good men. Since December, 1891, I have had charge of her. Been wearing R. E. sph. + 0.50 \odot cyl. + 0.75 ax. 90°; L. E. sph. + 0.50 \odot cyl. + 0.50 ax. 90° for distance, Esophoria 1°; exophoria in acc. 10°; abduction 4°; adduction 15°.

Tenotomies have been done, which gave temporary relief only. All kind of exercise with prisms. Various combinations of prisms with above correcting lenses have been prescribed. With none could she read or work more than a few minutes at a time.

On November 2, 1893, commenced exercising with innervation prisms.

In four weeks the muscular balance was as follows, and has remained so till to-day, May 24, 1894: Esophoria 4°; equilibrium in acc.; abduction 4°; adduction 36°.

All asthenopia and headache gone, uses eyes for anything and everything she chooses with absolutely no discomfort.

233½ North Summer Street.

A CASE OF INJURY TO EYE.

BY C. P. PINCKARD, M. D.,
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DAVID F., a printer, while "fooling" with a friend April 3, 1894, was struck in O. S. by the point of an umbrella. He had on his spectacles at the time and the blow broke the left lens. The thrust was not from directly in front, but somewhat from the left. The cornea was abraded below the center, the conjunctiva torn from the globe, the tear beginning at the limbus and extending in a pyramidal shape completely to the inner canthus. As far as could be determined the point of the umbrella penetrated the orbit about three-quarters of an inch beyond the caruncle. With a pair of forceps with spoon-shaped tips, I removed ten pieces of glass from the wound, some of them being one-half an inch deep. The largest of the pieces measured $4 \times 3 \times 2$ mm., five being the size of small grains of sand. The wound was flushed with 1-3000 corrosive sublimate solution; the conjunctiva stitched back in place, atropin solution instilled, iodoform applied, and the eye bandaged. A slight cut of the upper lid was also dressed.

April 4th. Conjunctival wound healing nicely. Fundus examined. Subretinal serous effusion slight at inner lower side in front of equator.

April 5th. Considerable pain last night, some circumcorneal injection, retinal separation less.

April 6th. No pain last night, retinal separation has disappeared. V., O. S., $\frac{20}{100}$ sph. — $4.50 \bigcirc$ cyl. — 0.50 axis $150^\circ = \frac{20}{30}$. V., O. D., $\frac{20}{100}$ sph. — $6 = \frac{20}{20}$.

April 7th. Stitches removed from conjunctiva. No pain. Improvement continued and patient was discharged well April 21, 1894. V., O. S. = $\frac{20}{20}$, with glasses. Movements of O. S. normal in all directions.

The case seems unusual because so little damage was done to the eye by a thrust striking the cornea, and not dislocating the lens or rupturing the iris, especially as the eye was so myopic. I expected to find the internal rectus cut or torn from its attachment, but it was not injured. The patient has been doing his regular work since May 1st with perfect comfort.

65 Randolph Street.

SOME CASES IN OPHTHALMIC PRACTICE.

By F. D. GREEN, M. D.,
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LEUCOMA OF THE CORNEA. PARALYSIS OF THE ACCOMMODATION
FROM DIPHTHERIA. A CASE OF SUBCONJUNCTIVAL HEM-
ORRHAGE. PARALYSIS OF THE EXTERNAL RECTUS.

AT the last year's meeting of the Colorado State Medical Society I was much interested in a case of leucoma of the cornea, exhibited by Dr. Chase, which he had treated by electricity. It therefore occurred to me that a paper reporting some of the cases that have been of especial interest to me in the past year might be of interest to others.

LEUCOMA OF THE CORNEA. In connection with the case of Dr. Chase referred to above, I would like to say that I have had one case presenting a most excellent opportunity to test the efficacy of his treatment, with results surpassing my most sanguine hopes.

James F., aged 25, laborer, was first seen by me in August, 1893. There was granular conjunctivitis of both eyes, accompanied by a central ulceration of each cornea; these ulcers were surrounded by a dense leucoma. Vision was reduced to a perception of light in both eyes; patient had to be led to the office. By vigorous treatment I succeeded in healing the granulations and ulcers by October 15, leaving a dense opacity over each cornea. The right presented only the lower and inner one-fourth free from opacity; the left, the lower third. I then began the ordinary treatment with very poor results. The eyes remained free from pain, but vision was limited to a mere perception of light. On December 5th, I began the application of the electric current as recommended by Dr. Chase, with the result that by January 1st, my patient was able to come to my office unattended. The daily application of electricity was continued until April 1st, when he was so much improved that he accepted a position and went to work. Patient was seen by me May 20th, and on inquiry as to his vision, said: "I see so well that I have made a seine for some persons who want to fish that way."

PARALYSIS OF THE ACCOMMODATION FROM DIPHTHERIA. The following case is given, not on account of the rarity of diphtheritic paralysis of the accommodation, for this is the most common form, but it shows how slight a case may be followed by paralysis.

Jennie S., aged 15, school girl, was brought to my office by her mother, complaining of loss of vision. She had been wearing glasses for compound hyperopic astigmatism, with which she was able to see at a distance, but was unable to read. The pupils were normal; reaction to light good; vision $\frac{20}{40}$ with glasses. She was able to read with strong convex lenses, but could not see at a distance with them. She had regurgitation of fluids through the nose upon attempting to swallow. Careful inquiry elicited the fact that she had suffered with a severe sore throat six weeks previous to her visit to my office, and although the family physician had not pronounced it diphtheria, he had taken this precaution to isolate her from the other children. I decided that it was an undoubted case of diphtheritic paralysis and ordered a tonic of iron and quinine with strychnia (1-30) three times daily. Patient made a rapid recovery.

A CASE OF SUBCONJUNCTIVAL HEMORRHAGE. Subconjunctival hemorrhage is a condition so frequently met with by the ophthalmologist, that my excuse for presenting the following case is the peculiar cause. The etiology is variously given by authors as injury, cerebral congestion, violent straining as in paroxysms of coughing, epilepsy, etc. In fracture of the orbit, extravasation may extend beneath the conjunctiva; it is sometimes seen in girls at the menstrual period; my experience has been that it is most frequently idiopathic, especially in elderly persons.

Paul R., school boy, aged 11, was brought to my office by his mother on November 27, 1893. He gave the following history: "On the 23d while in attendance at one of the public schools, on refusing to take his physical culture lesson, he was seized by his teacher, thrown to the floor and choked almost to insensibility, presumably as an example to other refractory pupils. As a result he had a severe subconjunctival hemorrhage, involving the entire inner and lower half of each ocular conjunctiva.

PARALYSIS OF THE EXTERNAL RECTUS—TRAUMATIC.

Frank M., aged 10, was referred to me by Dr. Duggins, with marked strabismus of the left eye, diplopia, and nausea. The father desired me to operate and straighten the eye. I found on inquiry that the squint had existed only since the boy had been thrown from a horse, two weeks previous to that time. He was thrown on his left side and picked up unconscious. He complained of diplopia and nausea when walking, which was so uncomfortable that he kept the eye covered. Vision L. E. $\frac{20}{40}$. There had been no ecchymosis of the lids, the right eye followed an object moved to the left causing the strabismus to become more marked. Mobility upward and downward was normal; projection to the left. There was homonymous diplopia on holding the test object on a horizontal plane, increased on holding it to the left, diminished on moving it to the right and finally disappearing. This was undoubtedly a paralysis of the left abducens (sixth) nerve.

I ordered potassium iodid, after meals. Patient returned one week later, squint much improved. Three weeks later almost gone. I have not seen him lately as he lives some distance in the country.

THE TOXIC AMBLYOPIAS; THEIR SYMPTOMS, VARIETIES, PATHIOLOGY AND TREATMENT.

BY CASEY A. WOOD, C. M., M. D.,
OF CHICAGO.

[Continued from Vol. III, page 88.]

CANNABIS INDICA. ARSENIC. LEAD SALTS. SALICYLIC ACID
AND SODIC SALICYLATE. COCAIN. VENOM OF POISONOUS
REPTILES. SALTS OF SILVER. MERCURIAL PREPARA-
TIONS. ERGOT. NITRITE OF AMYL. NITROUS
OXIDE GAS. MALE FERN. POMEGRANATE.
PTOMAINES. POISONOUS FUNGI. SYMP-
TOMS, DIAGNOSIS AND PROGNOSIS.

CANNABIS INDICA. Although, according to Ali (16), chronic indulgence in "haschisch" produces an amblyopia of the nicotine-alcohol type, the eye symptoms accompanying acute poisoning are by no means constant or characteristic. James Oliver (116) noticed dimness of vision and weakness of accommodation, the pupil being contracted, or of normal size. On the other hand Casiccia's (117) case developed mydriasis accompanied by hallucinations of vision, "lights and sparks of fire before the eyes." Susskind (118) also reports dilated pupils, while in Seifert's (119) case the pupils were of medium size and reacted slightly to light. Finally, Werner (120) reports an instance of cloudy *violet vision* in a small nervous woman, developed by $\frac{2}{3}$ gm. of the extract taken in nine divided doses. We may accept all this as evidencing the truth that the symptoms of chronic and acute poisoning produced by drugs are often widely different.

ARSENIC. The lids, conjunctiva, cornea and sclera of patients are often affected and the majority of the cases reported by ophthalmologists are merely descriptions of the hyperemia, edema and pigmentation of the external ocular apparatus that in chronic arsenical poisoning or during long continued medication also affect the skin and mucous membranes elsewhere.

The claim of arsenic to a place in Class I, Div. 1, of our classification is, however, supported by the evidence of more than one witness. Liebrecht (50) reports the following case from Schöler's klinik in Berlin:

A man, aged 30, examined on account of misty vision of four weeks standing. V., L. = $\frac{20}{200}$ Sn. vii; V., R. = fingers at eight feet and Sn. xvi. Pupillary reaction normal. Ophthalmoscope shows temporal pallor of disk. F. of V. normal at periphery, but they show an ill defined paracental scotoma for green and red. On the right side (near the fixation point), a very small absolute scotoma. Patient drinks no spirits and only a small amount of beer. Formerly smoked four or five cigars daily—for four weeks none. Doubtful luetic history.

During the previous three years and a half the patient had taken arsenic in pill form (dose unknown) for *psoriasis fere universalis*, the amount having been greatly increased during the past six weeks until within eight days when he was obliged to intermit it owing to the production of vomiting with pains in head and stomach. The outcome of this case is not recorded but the absolute scotoma, in the absence of other causes, would lead us to agree with the reporter in his assertion that the optic nerve lesion present was the result of the chronic arsenical poisoning and was not due to tobacco.

That cases of simple optic nerve neuritis occur is abundantly proven. Dana (121) in giving a full account of arsenical paralysis records such an instance in an American, aged 48, who was ordered Fowler's solution in increasing doses until at last he took ozss. *t. i. d.* After a month of treatment he had peripheral motor and sensory paresis as well as optic neuritis, with normal pupillary reflexes. The medicine was discontinued and in five months the patient was better.

In a second case the vision was impaired without optic inflammation.

H. Derby's (122) case is of great interest as the trouble was ultimately traced to the arsenical wall paper in the patient's library. The latter, a man of regular habits and previous good vision became so blind that V. R. = $\frac{1}{20}$; V. L. = $\frac{2}{10}$; bilateral optic neuritis with slight hemorrhage near r. o. d. *The urine was found to contain arsenic.* After removal of the probable cause patient gradually improved. Krehl (123) records a case of medicinal poisoning (Fowler's solution): a man, aged 23, who, formerly healthy, acquired a horizontal nystagmus of slight degree, with flashes before his eyes on gazing steadily at objects.

LEAD SALTS. The symptoms of this form of amblyopia are by no means constant because plumbism does not always affect the same parts of the eye. Among the earliest and most interesting contributions to this subject is the account given by Mr. Hutchinson (124) of five cases.

The commonest symptoms are those due to *optic nerve atrophy* which may come on slowly or be chronic from the beginning. The picture is usually that of a pale, well-defined disc with the arteries greatly reduced in caliber, even when the veins are distended. Sometimes there is slight congestion of the papilla, but this is accompanied by little swelling and the disc eventually becomes of a dirty gray tint with lines running along the narrowed vessels. Sight is always greatly affected, and the visual field may present both central and peripheral defects. This commonly goes on to total blindness. In five cases published by Landesberg (125), two had optic nerve atrophy and treatment was of no avail. Vision was reduced to $\frac{2}{100}$ and less in both eyes.

In a case described by Ulthoff: a color-mixer, aged 18, seen nine months after symptoms set in, not complicated by tobacco, alcohol, or renal affection, there appeared to be an extensive *retro-bulbar neuritis*. The vision in the right eye was only $\frac{7}{200}$ and in the left eye $\frac{8}{200}$. The F. of V. showed an absolute central scotoma with uncontracted periphery. There was a distinct pallor of the outer half of the disc. Very little improvement took place. DeWecker and Masselon (126) speak of true retro-bulbar neuritis as common in cases of lead poisoning, but say that if the poisoning persists the relative scotomata becomes absolute and increase in size.

In another and important class of cases the local manifestations are those of a decided *optic neuritis* with retinal and papillary hemorrhages, swelling of the disc, tortuous and obscured vessels. Gowers (127) figures such fundus in the case of a man, aged 45, who had marked cerebral symptoms such as headache, delirium, convulsions, etc. The disc is concealed by a swelling of moderate prominence bordered by a fringe of striated hemorrhage and of a color nearly that of the fundus. The veins a little larger than normal. Arteries concealed by the swelling and most of them very narrow. Vision was considerably impaired but could not be accurately tested, owing to his mental state.

Last, but by no means least, there may exist a state of *transient visual disturbance* without fundus changes, which is probably the most frequent of all. The amblyopia may last but a few hours, and many patients who finally exhibit signs of optic atrophy or neuritis give a history of antecedent "attacks" of dim vision. Gowers thinks this is analogous to the temporary amaurosis of diabetes, and is due to the direct effect of the lead upon the visual centers.

Stricker (128) records a well-marked example of temporary amblyopia in which, however, the attacks lasted much longer than they usually do. The patient, a woman, had intermittent epileptiform attacks due to lead poisoning. These were accompanied by a slight bilateral optic neuritis, giving rise to a sensation of fog before the eyes. For varying periods the vision sank so low that she could not see her hand. In the intervals of rest from the fits the cloudiness cleared up and the patient had normal acuity of vision. At one time the foggy sight lasted nine weeks, but eventually the attacks of saturnine epilepsy became less frequent and less severe, and with this improvement the optic disc again resumed its normal aspect. In the same way Günsburg (129) relates a case of temporary blindness (in which the lead poisoning had produced renal disease) associated with uremic symptoms. The loss of sight lasted several hours. The fundi were normal, but the pupils did not react to light. Next day V. was normal and the uremic symptoms had disappeared. Michel has observed in several cases of lead colic that the visual acuity temporarily diminished to mere perception of light although there were no fundus changes discernible. This state of things he considers a purely reflex amblyopia, and does not think it is due directly to the lead poisoning.

In chronic lead poisoning the general symptoms (characteristic dark line along the gums, colic, muscular paresis, arthralgiae, etc.) usually persist for a long time before vision is affected. Samelsohn (130) has pointed out, as a rare exception to this rule, the appearance of ocular affections before other signs of plumbism show themselves, and states that in such cases the former rapidly disappear when the poisonous influence is removed. In any event the eye is involved (seriously at least), in a very small percentage of cases of plumbism.

In Günsburg's (129) case the patient was unaffected until after he had been employed continuously for 27 years in the lead works. If the injurious habit or occupation of the patient is persisted in, organic lesions commonly show themselves with a permanent reduction of vision.

Although the above forms include the great majority of cases of lead amblyopia, many other ocular manifestations are on record, especially *paralysis of one or more of the extrinsic ocular muscles*. One of Landesberg's (125) cases had a bilateral paresis of the rectus externus: another had complete paralysis of all branches of the oculo-motorius. Von Schroeder (131) also reports a case of

typical neuro-retinitis with bilateral abducens paralysis. Landolt (132) describes a most interesting case of left-sided hemianesthesia with gray-red discs and irregular scotomata in both fields.

Wadsworth (133) gives a very instructive account of a boy aged 9, with marked optic neuritis and paralysis of several ocular muscles: lead was found in the urine for many months and vision was entirely lost from optic atrophy. The source of the lead was not ascertained.

The state of the pupils, to which importance is attached by some in the diagnosis of the ocular disturbance of plumbism, is not of much importance. They are often dilated during attacks of colic, but may, according to T. Oliver (19), be unequally affected. Their condition at other times will depend upon the amount and kind of the fundus changes.

The *diagnosis* of lead amblyopia rests upon the presence of the accompanying plumbism, although when nephritic or cerebral disease is present it may indeed be difficult to say whether the ocular disease be due to the direct or the indirect influence of the lead poisoning. There is no reason why the presence of lead salts in the body should not be demonstrated, and in all doubtful cases the urine should always be examined from time to time. C. A. Oliver (134) relates a case of progressive blindness in a male adult where the urine, saliva and nasal mucus revealed the presence of lead.

The *prognosis* is favorable when vision is not reduced and the fundus changes are slight or are recent, but very unfavorable in chronic atrophy, in the retinitis accompanying nephritis and in the neuritis following or accompanying cerebral disease.

SALICYLIC ACID AND THE SALICYLATES. There is not much to add to Gatti's (24) case. Knapp (135) says that the visual disturbance observed in three cases of poisoning by this drug *were about the same as in the milder attacks of quinine amaurosis*. They all got well quickly and left behind them no noticeable traces. As suggested, in speaking of the eye signs of quinine poisoning, it is very likely that a slight and temporary decrease of the visual acuity is not uncommon in persons taking large doses of the salicylates and that this symptom is likely to be overlooked or attributed to other causes. I have made diligent inquiry among a number of my confreres in general practice and have reason to believe that several such cases have been observed in Chicago.

Gibson and Telkin (136) relate a case of a middle-aged woman, where after two drams had been given (divided into 30-grain doses every two hours), the patient showed extreme contraction of the

pupils which were insensitive to light. Thirty hours afterwards there was complete recovery. In Schiffer's (137) case there were hallucinations of vision for twenty-four hours after an enema of seventy-five grains sodic salicylate.

COCAINE. There are no distinctive ocular symptoms resulting from either acute or chronic poisoning from cocaine. In a fatal case seen by me (resulting from the spraying of the naso-pharynx with a small quantity of a 20 per cent solution), that occurred while I was clinical assistant at the London Throat Hospital the pupils were fully dilated, but other observers have noticed contracted or even normal pupils during acute poisoning. Bettelheim (138) found a sensitive cornea in a similar case. Marckwort (139) reports a case where its long continued application to the nose probably produced an acute glaucoma; Chisholm, Javal and others believe that its application to the conjunctival sac may induce glaucomatous outbreaks. Hallucinations of vision, chromatopsia, diplopia, micropsia with dancing of objects before the eyes have all, as temporary symptoms of chronic cocaine poisoning and in persons addicted to the cocaine habit, been noticed by several observers, especially by Saury (140). In Bock's (25) case, ten minutes after the usual symptoms of poisoning set in, the patient complained of misty vision and became unconscious. Ophthalmoscopic examination showed, during and after the attack, no pallor of the nerve but diminution in size of the retinal arterioles. Vision the same as before the poisoning.

VENOM OF POISONOUS REPTILES. In my introduction of the subject I have already sufficiently spoken of the symptoms and course of the eye troubles in these forms of intoxication.

SILVER SALTS, MERCURY AND ITS SALTS. I have nothing to add to the introductory notes.

ERGOT. Knies, as well as Albutt, speaks of the contractile effects of ergot upon the retinal and nutrient opticus blood vessels, and as a result, marked pallor of the disc. A transitory amblyopia is produced by this vascular contraction and papillary anemia. The pupil is usually dilated and inactive. All these symptoms were well shown in a case of ergotism recorded by Hume (141) where an enema of an ounce of the fluid extract had been administered. Menche (142) observed these same symptoms during an epidemic of ergotism in Ober Hesse twenty-five years ago, but he is probably wrong in claiming a case of *iritis* as due to the effects of the poison.

But by far the most important ocular result of ergotism is the

production of *cataract*. The earliest account is given by Ignaz Meier (143) of twenty-three cases, victims of the epidemic of 1857, in the Siebenbürger district of South Germany. The wet summer produced disease of the rye and in spite of warnings to avoid the tainted bread the ignorant and half-starved peasantry ate it in large numbers; 283 were affected by ergotism of whom ninety-eight died. In the following year Meier saw fifteen women and eight men affected with slowly progressive (several months to a year in forming) cataract of the senile type. Both lenses were affected and the ocular disease seemed to confine itself to the crystalline; the retina, vitreous and opticus were healthy, and the extraction of the cataract was uniformly successful. Kortnew (144), during the widespread 1889-90 epidemic in the Russian Njatka government (caused by diseased rye meal, which affected 2,000 persons), had an excellent opportunity of studying the eye symptoms of this formidable disease. These set in about two months after the beginning of the epidemic and are divided by him into two groups; the first complained of intermittent failure of vision coming on in some instances several times a day, sometimes only once a week, and in others at longer intervals. The average number of attacks during the whole illness was from three to five. None of these patients complained of total or permanent loss of vision.

With the second class of cases it was quite different. The loss of vision not only persisted but got gradually worse as the convulsive seizures, due to the poison, continued. In every such instance opacities were found in the crystalline, which presented the smoky gray appearance of senile cataract. In all the instances of this kind, thirty-seven, the opacity spread from the center towards the periphery, and in from three months to a year became complete. Little children were blind in from two to three months; adults over forty took longer, from eight to twelve months. The extraction of such cataracts was ordinarily successful except that there was an unusual loss of vitreous.

Tepljaschin (145) examined twenty-seven cases of this form of cataract in Russians affected by the disease and found the same conditions reported by Kortnew.

NITROUS OXIDE GAS. Observations of Aldridge (146) confirm what one would naturally expect to discover with the ophthalmoscope—dilatation of the retinal arteries and hyperemia of the papilla. This condition is essentially a transitory one and disappears with the elimination from the blood of the toxic agent that gave rise to it.

AMYL NITRITE acts on the optic and retinal vessels in much the same way as laughing gas. Chromatopsia of the parti-colored (mixtures of yellow, violet, black, white and red) variety, as well as hallucinations of vision have often been observed, but, so far as I know, no permanent changes in the ocular apparatus have resulted from its employment in medicine or in poisoning by it.

MALE FERN. There are several well authenticated instances of *amaurosis* and amblyopia from acute poisoning by this drug. In a fatal case reported by Eich (147) the symptoms were those of strychnia poisoning with contracted pupils. In some severe cases of poisoning when the patients survived, blindness, the result of optic nerve atrophy has been several times recorded. Schlier (148) reports a case of temporary amaurosis complicated with albuminuria, but the history of several other cases reads like quinine amaurosis. Zimmermann (149) records an instance of bilateral opticus atrophy from a dose of ten grams of the extract, and Fritz (150) of a unilateral atrophy following the acute blindness. Fritz's case is worth recording in full:

A well nourished girl, servant, aged 18, suffering from taenia, bought at a drug store ten capsules of extr. fil. maris, each containing one gram, and took a capsule every hour. As soon as she had taken six she was attacked by convulsions and coma, and when she recovered from these was blind in both eyes and her pupils were widely dilated. In the course of a week the sight in the right eye began to improve, but very slowly, until after several months the visual acuity again became normal. The left eye remained amaurotic and in it atrophy of the optic nerve was plainly made out. The papilla became very white and the eye was finally affected by strabismus.

POMEGRANATE. Jacobson (128) records an instance of poisoning by the extract where the effects resembled those of the cycloplegic intoxicants—paresis of accommodation and dullness of distant vision from the development of latent hypermetropia. According to Dujardin-Beaumetz hypodermic injections of sulphate of pelletierine and isopelletierine (alkaloids from the root-bark) produced marked dilatation of the retinal vessels, contracted pupils and scleral injection.

EXTRACT OF POMEGRANATE AND MALE FERN. Bayer (151) describes a case in which after a dose of 17.5 grms. of extract granati, mixed with the same quantity of male fern extract (divided into seven hourly doses of 2.5 grms. each), vomiting, faintness and unconsciousness lasting thirty hours were observed. The patient became blind in the left eye and visual acuity was dull in the right. The blindness was, in the light of other cases, probably due to the poisonous action of the male fern.

PTOMAINE POISONING. Botulismus. Allantiasis. In a properly constructed review of the amblyopias resulting from this form of intoxication and following the rule laid down by me in the beginning of these studies, each ptomaine should be considered under separate headings, but as neither these putrefactive alkaloids, nor the poisonous leucomaines have all been isolated, and as it is very probable that the ocular symptoms in many instances arise from the combined action of two or more poisons, no such satisfactory arrangement of them can be had.

In the same way the leucomaines have been treated of under such headings as *venom of snakes*, *toad poison*, *poisonous fungi*, etc.

There is a close family resemblance to certain alkaloids, notably *atropia*, *eserin*, curare and strychnia, in the action of ptomaines upon the eye and general system. As an example of this, *muscarin* and *neurin* produce miosis and spasm of accommodation; *tyrotoxin* paresis of accommodation and mydriasis.

In most of the recorded instances of toxalbumin poisoning, where life was saved, the visual acuity shortly returned; there were no fundus changes and no injury to optic nerve or retina.

Paresis or *paralysis of accommodation* (bilateral and usually accompanied by widely dilated pupils) is the most common eye symptom of poisoning by decomposed *meat*.

Partial and transitory visual failure has frequently been noticed and is likely to be, and probably often has been overlooked or misinterpreted. M. Knies (152) relates a case where two persons who ate of the same fish (which was apparently above suspicion), had as a result a paresis of accommodation that lasted twenty-four hours.

All the extrinsic ocular muscles have been affected, from bilateral and nearly complete ophthalmoplegia externa to paresis of a single muscle. Of these *ptosis* is the commonest of the oculo-motor pareses and has been noticed by many observers *e. gr.*, by Kaatzer (153), Hirschfeld (32), Flury (154), Federschmidt (31) and Pürkhauser (155).

These symptoms do not, as a rule, show themselves for several days after the poisoning. Boehm (155) cites a case where the paralysis was first noticed nine days after the ingestion of the food.

Groenouw (30) gives the following account of a few cases:

W. G., aged 29, the next day after eating a full meal of raw ham found that his throat was dry, that he could hardly swallow his food (especially dry bread), and that he was unable to read ordinary print. He was slightly

myopic, and it was estimated that he had lost through the cycloplegia present 5 D. left, and 6 D. right, of accommodative power. Under treatment the symptoms slowly disappeared.

Two other cases occurred in the same family and presented about the same symptoms. The ocular signs declared themselves in from two to five days and lasted for nine weeks. The remains of the ham were fed to mice whom it killed in twenty-four hours. Parts of the dead mice were fed to other mice who remained perfectly healthy, from which it was concluded that the poison was a ptomaine or ptomaines and that death did not result from bacteria, none of which could be detected in the ham or dead mice.

Eichenberg (157) noticed in a case of sausage poisoning, which ended fatally, not only a third nerve paralysis, but a unilateral abducens paresis. Federschmidt (31) saw twenty-two cases of "Wurstgift," the ocular symptoms being in addition to accommodative failure, dilated pupils, cloudy vision, diplopia (three cases), and in one instance paresis of the *lev. palp. sup.*

The differential *diagnosis* of these cases may not always be easy, especially from diphtheria and poisoning by the mydriatic alkaloids. The presence or absence of *paralysis* of the extrinsic ocular muscles, the course of the accommodative paresis, as well as the nature of the general symptoms must, of course, be considered. Quite recently an American practitioner wrote a short article for a well-known medical journal in which he described several cases of atropine poisoning from eating *turkey*. He explained the symptoms by assuming that the bird, in question had, just before his death, fed on belladonna berries or some other plant possessing cycloplegic properties, and that when served at the table his flesh, being impregnated with the poison, had acted like an overdose of belladonna extract. This error was quite pardonable and doubtless many physicians, unaware of the cycloplegic action of tyrotoxin (tyrotoxonon) and other ptomaines, have made similar mistakes.

The *prognosis* is generally good and recovery is usually rapid. When death does not occur and the muscular paralyses persist it is likely that central changes (basilar neuritis or meningitis or nuclear hemorrhages) have been produced by the intoxication. Some of these last cases present symptoms closely resembling typhoid fever (even to changes in Peyer's patches, intestinal ulcerations, etc.), and may easily be mistaken for it.

FUNGUS POISONING. Manifestations of this form of intoxication naturally depend upon the kind of fungus, since the active agents in the various mushrooms, toadstools, etc., vary greatly. Some of them when eaten in poisonous doses produce accommodative

spasm and contraction of the pupil, only, as Knies points out, these symptoms occur in order the reverse of those brought about by eserine, the spasm coming on first. Such a fungus is the *agaricus muscarius* whose active principle—*muscarin*—closely resembles the ptomaine named *neurin*. The *agaricus phalloides* on the other hand, does not affect the pupil, although, as Handford (158) has shown, disturbances of vision result from poisoning by it. In Maurer's (159) case the pupils were dilated *ad maximum*.

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[To be Continued.]

PERSISTENT MOBILITY OF THE STAPES IN SOME CASES OF CHRONIC CATARRHAL DEAFNESS.

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IN six cases of chronic catarrhal deafness, tinnitus aurium and tympanic vertigo, in which I have performed tympanotomy, and removed the incus, I have found at the time of the operation, that the mobility of the stapes was *perfect*; in other words, this bonelet was not ankylosed in the oval window.

In these cases the relief from tinnitus and vertigo, following the operation, has been prompt and marked while the improvement in hearing has been little or wanting entirely. In illustration let me present the account of the following case:

Mr. W. P., aged 34, a clerk, consulted me January 29, 1894, at the suggestion of Dr. W. H. Bunn of this city. The patient's left membrana tympani presented the ordinary symptoms of chronic catarrh of the middle ear, viz.: opacity and retraction. The hearing on this side was ten inches for isolated words, and two inches for the large clinical tuning-fork by aerial conduction. No tinnitus in the *left* ear. The pharynx was in good condition: the nares, however, showed signs of acute rhinitis. The patient said he thought the hardness of hearing in the left ear had grown worse lately.

Treatment of the nares and naso-pharynx by mild antiseptic sprays relieved the rhinitis and improved the hearing to some extent in the left ear. On the *right* side, however, an altogether different condition was discovered. Here the membrana was perforated below the manubrium, and through the heart-shaped opening the mucous membrane beyond gave evidence of having been the seat of chronic purulency. The membrana was thick and rigid and seemingly attached to the incus, or its remnant, and lying against and pushing inward the stapes, which bone, however, was *not visible*. The deafness in this ear was profound. For two months previous the tinnitus had been increasing in the right ear and the patient had experienced an unaccountable tendency to vertigo, which he supposed to be due to stomachic derangement.

The exacerbations of vertigo became more frequent and more intense until the patient was afraid to walk in the street alone, and at last, in February, he ceased to go to his business on account of the tinnitus and tympanic vertigo.

It now became manifest that these disagreeable symptoms in the *right* ear were due to impaction of the stapes in the oval window. It was therefore proposed to liberate the stapes by cutting into the thickened, upper posterior quadrant of the membrana tympani, and then removing the incus. The patient was etherized March 2, 1894, and a wide incision made in the thick membrana. A piece of the long shaft of the incus (the only vestige of this bone-let) was found imbedded in the thickened membrana and removed. This exposed and liberated the stapes, which was found to be *very movable*. Owing to the upward shrinking of the membrana into the attic, a condition I have observed in other cases of loss of the incus, from chronic suppuration, the stapes appeared relatively very low, nearly on a line with the lower end of the manubrium. The stapes is still plainly visible and readily movable in this case.

After the operation the vertiginous tendency rapidly diminished. In a week the patient was able to walk in the street alone and he returned to his business. The tinnitus grew less but not as rapidly as the vertigo. *The hearing was not improved.*

It becomes manifest therefore that a mobile stapes does not insure good hearing. The cause of deafness in such cases must be due to an alteration in the proximal nerve structures of the labyrinth, *i. e.*, those nearest the diseased mucous membrane of the drum-cavity. They indeed may be instances of nervous deafness, the result of structural changes in the labyrinth tissues, induced by an extension of the catarrhal lesion of the mucous membrane of the tympanum, sclerotic in nature, through the intimate vascular connection of the latter with the vascularity of the labyrinth. No operation of any kind can possibly improve the *hearing* in such cases.

The relief from tinnitus and vertigo which follows the operation of tympanotomy and removal of the incus, must be due to the liberation of the stapes and diminished intra-labyrinth pressure. The latter relieves the motor filaments of the auditory nerve, the distal element in the nervous structures in the labyrinth unaltered by the catarrhal disease in the drum-cavity, and motor disturbances and defective equilibration cease.

Since writing the above I have discovered an account of a post-

mortem examination by Bezold,¹ of Munich, in the case of a man 30 years old in whom there had been marked chronic deafness. Perception of low tones was well maintained, but that of high tones greatly diminished. There was poor bone conduction. Rinne's test was positive and the membranæ were normal.

Diagnosis: Nervous deafness. Death from typhoid fever. At the autopsy there was found atrophy of the nerve-fibers in the first and second whorls of the cochlea. *The annular ligament of the stapes and the membrane of the round window were intact.*

¹ Annales des Maladies de l'oreille, etc., February, 1894.

TREATMENT OF OTITIS MEDIA PURULENTA
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OUT-DOOR DEPARTMENT FOR NOSE, THROAT AND
EAR DISEASES.

THERE is no doubt that there are still some practitioners who regard a discharge of pus from the middle ear as a simple and comparatively unimportant matter; there are those among the laity who believe that an ear discharge may be even beneficial to the individual, giving vent to a poison which, if stopped, would work greater devastation at some other less accessible point. We can only say that one notion is hardly less erroneous than the other, for we have come to know that as long as a suppurative process in the ear continues, no difference how slight that may be, it constitutes an unceasing menace to the life of the individual. We have only to glance at the following statistics to be convinced of the truth of this assertion:

Pitt found in 9,000 consecutive autopsies at Guy's hospital that suppurative otitis was the cause of death in one out of 158 cases.

Barker collected the statistics of three other London hospitals and found that among 8,020 autopsies suppurative otitis was the cause of death in one out of 179 cases.

Bezold gives the percentage of deaths in 325 cases of suppurative otitis as $1\frac{1}{2}$ per cent. Chauved, Schwartze, and others have given their statistics, but it is not from these that we should draw our conclusions, for the gravest cases do not come to the special clinics, but to the general hospitals. We will be nearer right if we accept the percentage of Barker (*loc. cit.*). This writer collected the statistics of the University hospital, London, and found that 820 cases of acute and chronic suppurative otitis gave a mortality of 2.5 per cent.

It would seem, too, that a proper appreciation of the factors which tend to perpetuate an ear discharge is not so general as it

should be, or else we would not see so many acute cases terminating in chronicity, nor meet so frequently in our clinical practice those cases which go on suppurating for years and years, and which yield such gratifying results after a few weeks of proper treatment.

This thesis is prepared with the purpose of calling attention to the foregoing facts, and laying before the practitioners of this commonwealth the simpler methods of treatment of otitis media purulenta chronica which, if followed out, will be of great advantage to their patients and themselves.

Rarely does a chronic suppuration in the middle ear begin as such; more rarely still does it begin as the result of some pre-existing inflammation (*e. g.*, eczema) of the external auditory canal, still more rarely does it spread from the labyrinth. By far the large number of cases have their origin in an acute attack, in the course of which the tympanum becomes perforated.

A simple acute refractive otitis comes to an end usually under favorable conditions and careful treatment in from two to three weeks. Exceptional cases may end as soon as two or three days. If a case persists for over six weeks it should be considered chronic. Predisposing conditions which tend to convert the acute into a chronic process, such as the cachexias, tuberculosis, scrofula, syphilis, diabetes, etc., should be treated according to the usual constitutional methods.

The most frequent local cause of the persistence of the suppurative process is retention of secretion. The anatomical formation of the middle ear is most favorable to this, and when it does occur the irritating secretions continuously reacts upon the mucosa and the bone beneath or in the middle ear, producing thickening granulation, ulceration, etc., of the former, or even caries or necrosis of the latter. This retention may be due to neglect or to insufficient means of drainage, that is, the suppuration may be extended in the attic; the perforation may be too small or too high in the membrane to allow of free drainage. In many cases, however, simple syringing of the ear will, if done properly, bring about cessation of the inflammatory action. For this purpose, in cases where the perforation was large, I have been using acid solution of corrosive sublimate 1-5000, using a pint or a quart twice or four times or even oftener daily, according to the amount of secretion. In some cases the frequent and constant use of this agent will become irritating, especially in the very young, or if the Eustachian tube be very patulous it may get into the pharynx and thus cause muralism, so that some care must be observed in its employment,

but in a large number of cases its use is followed by very beneficial results. I have been using lately a product of the French laboratory known as phenosalyl. It may be used in double the strengths in which carbolic acid may be employed. I have found it very unirritating and trustworthy, but it is too expensive for dispensary work. Many other antiseptics may be used in the ear, carbolic acid 2 to 5 per cent, boric acid, saturated solution, or a teaspoonful of a 20 per cent solution in alcohol may be added to a half pint of warm water. But when the pus is offensive in odor the boric acid is not sufficient to overcome it. A teaspoonful of a 10 per cent (alcoholic) solution of salicylic acid to three pints of water may be employed, or a weak, light claret-colored solution of permanganate of potassium, or chlorin water (one part aqua chlori to three parts water). It is well to change the medicament from time to time, and especially if one or another sets up an irritation.

It is always well to use the air douche, either Valsalva's or Politzer's, in the midst of washing out, in the endeavor to completely evacuate the pus. It is also requisite in many cases, and especially in those having a small perforation, to employ the injection of antiseptics into the middle ear via the Eustachian tube. Schwartze believes this method of treatment to be of the greatest value. I am quite convinced that his praises are not wrongly bestowed. To do this we may employ the catheter or we may, in cases of double perforation, use Gruber's method. In this, a syringe having a capacity of three and one-half ounces with a well-rounded end, capable of completely filling the nostril, is employed. The process is conducted as follows: "The patient being placed as for catheterization, and having cleared out his nose, holds his head so that the nasal meati will have a horizontal direction. The operator standing in front and taking the syringe in his right hand, slightly raises the tip of the nose with the thumb of the left hand, as in the introduction of the catheter, and inserts the nozzle of the syringe within one nostril, while he at the same time closes the other nostril by pressure upon its side with the index finger. The syringe being held horizontally, with the nozzle free from the walls of the nostril, is then emptied with the requisite amount of force. During this procedure the soft palate is instinctively held tense, so as to shut off the post-nasal space from the pharynx, and so preventing the fluid from escaping below. The tongue is also held back and pressed against the soft palate so as to close the passage more firmly. The fluid which enters the

post-nasal space through one nostril can in the majority of cases only flow round toward the opposite Eustachian tube, and so through the opposite side of the nose. If then the latter is closed the liquid under the pressure employed passes through the Eustachian tube, when this is patent, toward the middle ear. The degree of force with which the fluid enters the middle ear will depend upon the force with which the syringe is emptied, upon the completeness with which the outlets at the nostrils and palate are closed, and the permeability of the Eustachian tubes. There may be slight dizziness after this procedure, but this usually disappears after it has been used a few times.

It is as an antiseptic in flushing out the middle ear through the Eustachian tube that phenosalyl acts so satisfactorily. While it has twice the strength of carbolic acid it is far less irritating, and is equally active in destroying the disagreeable odor, while it is much less offensive to the taste of the patient. It is of the utmost importance that in all of these solutions the water should be sterilized just before using. This is easily done by boiling the water ten minutes before adding the medicament. Pure water should never be used as it is irritating to the mucous membrane of the nose and Eustachian tube. Common table salt, one-half teaspoonful to a quart, renders the water bland and makes a bland solution.

After all irrigations the ear and auditory canal should be carefully and thoroughly dried by means of cotton and the cotton carrier. The auditory canal should then be carefully and not too tightly packed. The use of a plug of cotton in the most external opening of the canal is insufficient, and I am inclined to think that an antiseptic gauze is preferable to cotton. This should be carried well in; in cases where there are large perforations the gauze may even enter the middle ear. The packing should be changed as often as it becomes moistened by the discharge, and even if this does not occur it should be changed once or twice a day. This packing not only protects the coverings of the external auditory canal, and tends by the presence of the antiseptic material in the gauze, to prevent the pus from decomposing; but it also aids in drainage as we have learned from general surgical experience.

There are cases in which the syringe cannot be used on account of the nausea, dizziness, etc., which the stream of water impinging on the structures of the middle ear produces. In such cases we may remove the discharge by means of Gruber's syringe by suction; we must "dry clean," according to the method of Becker,

that is by means of the cotton pledget. This is a part of that author's "dry method." And it brings us to say that we cannot indorse the indiscriminate use of dry powders in the ear. In fact, they should be used with the greatest care, and then only by the medical man who has become more or less dexterous in aural manipulations. They should never be used in the young, or where the perforation is small, or situated high up in the membrana. Indeed, in such cases, the use of powder in the ear may be followed with disastrous results by the powder stopping up the points of egress for the pus. However, we do not mean to discourage the employment of powders altogether. In those cases which do not cease in about a month under the treatment we have just described and where there is an ample opening in the membrana, it is our custom to insufflate boric acid. When, after a few days trial, the discharge is not diminished, and small granulations remain, we use a powder composed of three parts of finely-powdered alum to ten parts of boric acid. These insufflations at first are made daily; then less frequently, according to the amount of discharge. Equal parts of salicylic acid and magnesia makes a very satisfactory combination. Sozoiodal of zinc 3 to 5 per cent in a neutral excipient has been lately extolled, but we have not as yet had sufficient experience with it to allow us to express an opinion. As Politzer says, "it is always well to change the medication from time to time; we seem to get different results from the same drug in different cases and at different times."

Where a fluid application is required to destroy granulations, heal ulcerations, reduce congestion, we give preference to chromic acid solution, carried carefully into the middle ear by means of cotton on a cotton carrier. Or in cases of small perforation we may make an instillation of absolute alcohol, two or three drops, the patient retaining it for two or three minutes with the head inclined to the opposite side. This is very effective in destroying granulations and reducing the congestion of the mucous membrane lining the middle ear, but it is liable to produce pain and vertigo, in which case we should cease its use.

Schwartz recommends a solution of liq. plumbi subacetatis in distilled water, 1 to 10 per cent; or zinc sulph., 2 to 10 per cent; or cupri sulph., 1 to 5 per cent. In those cases of long duration and after other remedies have failed we may employ the caustic solutions of nitrate of silver. Five to ten drops of a 5 to 10 per cent solution should be employed, and the patient directed to turn the head in various directions so that the solution shall reach every portion

of the middle ear possible. In many cases it will run through the Eustachian tube to the pharynx: this is more beneficial than otherwise, but if the other ear is healthy the head should not be inclined too far to that side or the medicament is liable to run through its Eustachian tube. The nitrate produces on the diseased mucosa a whitish coating: as soon as this comes away the instillation should be repeated, but not before. This happens twice daily in some cases, especially when the mucosa is swollen. Usually the instillation is required daily. After a few applications we often see the most beneficial results. The nitrate's action may be neutralized at any time when its action is thought to be excessive by a concentrated solution of common salt. Indeed it is well always after the nitrate has been in contact with the mucosa a minute or less to remove it and wash out with the salt solution. Painting the outer skin with a 10 per cent solution of iodid of potassium protects it from the discoloration which the nitrate is otherwise liable to produce. If, in the course of the employment of the nitrate or of any of the astringents an acute otitis intervene, the use of these remedies should be stopped until the acute inflammation has come to an end.

Before any of these applications are made it is understood that the ear has been thoroughly washed out either through the external auditory canal or through the Eustachian tube, and that it has been thoroughly dried with cotton on the cotton carrier.

After the discharge has ceased, the air douche should be used for some little time, first once a day then three times weekly, then once a week. If there is an occasional discharge of mucous from the ear we may cover the mucosa of the tympanum with a thin film of alum. All pathological conditions in the nose or cavum pharyngens must be carefully treated. The ear should be protected by wearing a cotton plug in the auditory canal for a month or more, and this should not be removed except in a room kept at an even temperature.

ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY

A QUARTERLY JOURNAL OF PRACTICAL OPHTHALMOLOGY,
OTOLOGY, RHINOLOGY AND LARYNGOLOGY.

EDITED BY

JAMES PLEASANT PARKER, M. D.,
SAINT LOUIS, MISSOURI.

Subscription Price, Including Postage in North America:

PER ANNUM, IN ADVANCE,	\$4.00
SINGLE COPIES,	1.25

SAINT LOUIS, MISSOURI:

VOL. III.

JULY, 1894.

No. 3.

CLINICAL MEMORANDA.

TWO CASES OF HOMATROPIN IDIOSYNCRASY.

BY H. MC. I. MORTON, M. S., M. D.,
OF MINNEAPOLIS, MINN.

OPHTHALMOLOGIST TO ST. BARNABAS HOSPITAL.

THE two cases which I report are not of a class that is at all very unusual, yet the extreme susceptibility to the influence of a mydriatic, as shown in both, are of interest as "clinical memoranda."

Case I. Staggering gait, partial collapse, and hallucinations after one instillation of a solution of homatropin:

C. B., aged 17, consulted me relative to an annoying headache. He was an overgrown boy, and lacking muscular development. Neurotic tendency obvious; does not use tobacco or alcohol; family history good. After an examination, an error of refraction being detected, I prescribed a solution of homatropin (4 grs. to the ounce), directing him to use one drop in

each eye for six consecutive times, and at ten minute intervals. After one instillation, he neglected the second for about half an hour, and "feeling queer" came to my office. Having at this time, apparently, a complete paralysis of accommodation and decided mydriasis, I sat him in the chair and started to test him. He could scarcely speak, the words being almost inaudible, and the syllables interrupted. He was greatly confused with the chart, not being able to follow the letters in the lines. He told me that he saw men walking about the office, and that when he spoke to them they would disappear, and to return again. I had him rest upon a couch and he was soon able to get home with the assistance of a friend. His pulse was small and rapid, face flushed, and he staggered without an assisting arm. He was all right next day, but the subsequent tests were made without a mydriatic, and aided by the retinoscope and ophthalmometer.

Case II. Persistent paralysis of accommodation, and mydriasis after the use of homatropin.

J. W., aged 19, white. General health good; muscular development above the average. Has retinal hyperesthesia. Used a solution of homatropin (4 grs. to the ounce) to determine refractive status. The eye proved absolutely emmetropic. Has very insufficient interni, having an adduction of 12; abduction 9. The homatropin solution was used for two days and just one hour before coming to my office. The effect was very decided, and unpleasantly persistent for both patient and myself, since I had informed him he would have the use of his eyes in about forty-eight hours. The mydriasis persisted for three weeks, and about the same length of time elapsed before he could use his eyes at the near point at all. It must be remembered that homatropin was used and I tremble to think what time it would have taken for the effect of atropin sulph. to have passed off. In fact, the patient told me after, strange to say, that an oculist had him under the influence of atropin, and he had been a much longer time in recovering. His family physician has since informed me that the one two-hundredth of a grain of hyoscin produced dilatation of the pupil.

504-5-6-7 Dayton Building.

TREATMENT OF PURULENT RHINITIS, SYCOSIS,
AND ECZEMA OF THE ALÆ NASI.BY WALTER F. CHAPPELL, M. D., M. R. S. C., ENG.,
OF NEW YORK.SURGEON TO THE THROAT AND NOSE DEPARTMENT MANHATTAN EYE AND
EAR HOSPITAL.

THE simpler diseases met with in practice frequently tax the physician's patience and resources beyond one's expectations.

The affections named in the title of this paper may be placed in this class, and is my excuse for presenting their treatment. Although similar in appearance, symptoms and situation, they differ greatly in etiology, but respond more or less quickly to the same treatment.

Cases of purulent rhinitis are infrequent excepting in childhood, when they usually accompany or precede a more or less severe ophthalmia. It is probable that the nasal symptoms are always secondary to the ophthalmic and result from an extension of the inflammatory process through the lachrymal canal. The nasal discharge is profuse and milky in appearance and very irritating to the skin of the upper lip which is frequently covered with moist crusts. Sycosis of the hair follicles in the interior of the alæ nasi is chiefly confined to adults. It causes considerable itching, tenderness and dryness, with the formation of thin, dry scales, and is so nearly allied to eczema that it is difficult to differentiate them. Eczema of the nares, however, usually accompanies eczema of other parts of the body, and is influenced by the general treatment employed for this disease. Various powders, lotions and ointments are prescribed for these affections with indifferent success. In nitrate of silver, however, we have almost a specific. Its well-known astringent and alterative qualities, when locally applied, are well exemplified in these affections. Any alkaline solution, followed by peroxide of hydrogen, may be employed to remove the crusts and discharge, and after drying, an application of ten grains to the ounce solution of nitrate of silver is made.

In the majority of cases no other treatment need be employed; an occasional case of eczema or sycosis may be assisted by some oily preparation of zinc, such as:

R Acidi tannici gr. iii.
 Acidi carbolici..... gr. ii.
 Benzoinalis ʒss.
 Ung. oxidi zinci.....qs ad ʒi.
 M. ft. Ungt.

Sig. Apply at night.

Short reports of a few cases will show their character and quick response to treatment.

Case I. M. D., aged 2½, came to the hospital November 6, 1893, suffering from purulent rhinitis and conjunctivitis of three weeks duration. Both alæ nasi were covered with crusts on their interior surface, and a considerable portion of the upper lip was in a similar condition. Various powders and ointments had been used with little effect before she came to the hospital. After removing the crusts, cleansing and drying the parts, a solution of nitrate of silver, ten grains to the ounce, was applied to the anterior part of both nares as far back as the opening of the lachrymal duct, also on the cutaneous surface of the upper lip wherever it presented a red appearance. This patient returned on November 8th, much benefitted, and when seen again on the 12th was perfectly well.

Case II. ———, aged 9, was first seen November 27, 1893. Small dry scales covered the cutaneous surface of the interior of the alæ nasi and at the lower margin small cracks were noticeable, which caused considerable tenderness. After cleansing the parts a twenty-grain solution of nitrate of silver was applied.

November 29th, patient returned markedly improved and on his next visit, December 1st, was perfectly well.

Case III. November 27th. M. K., aged 11, has had sore nose for several months. A diagnosis of eczema alæ nasi was made, and an ointment containing carbolic acid and oxid of zinc ordered. This patient returned on January 17th, very little improved. A ten-grain solution of nitrate of silver was then applied every other day for a week, at the end of which time the patient was perfectly well.

Case IV. M. M., aged 11, seen March 12th. Both alæ nasi filled with scabs of dried mucons of six weeks duration. The scabs were removed and nitrate of silver applied. When seen five days later the nares were quite clear.

Case V. Mary McC. Seen first on March 12th; had purulent ophthalmia and rhinitis for the previous seven weeks. The eye symptoms preceded the nasal discharge three days, and under treatment, were nearly well, but the nasal discharge and crusts continued unrelieved although various methods of treatment had been employed. The daily application of ten-grain solution of nitrate of silver completely relieved this case in six days.

Case VI. S. K., aged 12, seen first April 2d; had purulent ophthalmia and rhinitis of four weeks duration. Four applications of a ten-grain solution of nitrate of silver at intervals of two days relieved all the symptoms.

Case VII. April 23, 1894. K. M., eighteen months old, for two weeks had a thin, yellowish-white discharge from both nostrils; the cutaneous surface of the alae nasi and upper lip was very red and covered with thin yellow scales.

This case responded to two applications of silver nitrate made within four days.

Case VIII. F. M., aged 7, brother of Case No. 7. A week after his sister's nose began to discharge, his also was affected in a similar way. The redness and irritation was confined to the interior of the alae nasi, and responded to two applications of argent nit.

Case IX. J. McG., aged 7. May 7th. Purulent rhinitis and ophthalmia of four weeks duration. Inflammation extending to the upper lip. Twenty-grain solution of nitrate of silver applied. May 11th, nearly well. Silver solution ten grains to the ounce applied. On return to clinic on the 12th, the discharge and inflammatory symptoms had entirely subsided.

In looking over the histories of these cases, we find that about five days was the average time required for their relief by the nitrate of silver treatment. In private practice, this period may be shortened by supplementing the first application of the ten-grain silver solution with subsequent daily sprays of one-grain solutions.

22 East Forty-Second Street.

NEW INSTRUMENTS.

By FRANCIS B. KELLOGG, M. D.,
OF TACOMA, WASH.

GRUBER'S POST-NASAL CURETTE.

I WOULD like to call the attention of the profession to a post-nasal curette which is the production of the veteran aurist, Prof. Joseph Gruber, of Vienna.

It is a modification of the Gottstein post-nasal knife, but is radically different in construction, having only the method of use in common with that instrument.

The Gottstein knife has a thin cutting blade whose edge when in position in the naso-pharynx presents backward and downward. It is slightly crescentic in form and supported by two uprights which unite below giving it the general shape of a curette, though its action is a cutting rather than a scraping one.



GOTTSTEIN'S POST-NASAL KNIFE.

The method of using both the Gottstein and Gruber curettes is as follows: The surgeon faces the patient who, if a child, may be anesthetized and held in the lap of the assistant. The mouth is opened, by force if necessary, and the working part of the instrument is slipped behind the soft palate, the tongue being depressed by the index finger of the left hand. The handle is now allowed to sink which throws the top of the knife or curette towards the front of the naso-pharynx until it impinges against the septum. It is then pushed gently upward and backward (referred to the patient), when the adenoid tissue will be felt to engage in the loop of the instrument. Then, increasing the pressure, especially upward, the blade is made to follow the curve of the nasopharyngeal wall, hugging it as closely as possible and cutting away the dependent vegetations. This is accomplished with one vigorous sweep of the instrument during which the handle is elevated from its dependent position and carried upward towards the face, landing the loop and the growth upon the dorsum of the tongue.

Before proceeding to detail the advantages of the Gruber curette, I will briefly mention another devised by Prof. Politzer which is also a modification of the Gottstein. It differs from the latter in having at the middle point of its blade a re-entering angle, giving to the loop the outline of a heart. This angle is supposed to fit saddlewise the free edge of the vomer where it is continued into the roof of the vault, and to remove any tissue which might be protected by the latter from a straight or convex edge. The advantages of this instrument are, in my opinion, theoretical rather than practical. In adjusting it to the peculiarities of the anterior naso-pharynx it is unfitted for every other part. After leaving its central septal guide which extends only a very short distance into the cavity, the re-entering angle acts as a protector to all the adenoid tissue in the middle line over which it passes. This part is apparently sacrificed to reach the sides of the growth which impinge upon and occlude more directly the aural and nasal orifices. This end, however, can be much more effectually



GRUBER'S POST-NASAL CURETTE.

ally accomplished by the Gruber curette, as will be seen later. Personally, I incline to the belief that the removal of the bulk of the growth in the middle line accomplishes all that is necessary or desirable. The portions which escape in the sulci beside the vomer are insignificant and can exercise no serious pressure laterally after they have adjusted themselves to their new mechanical conditions.

There is no doubt but that the introduction of the Gottstein knife marked an epoch in the treatment of post-nasal adenoids. It is infinitely superior to all forms of forceps, which can only be used in an adult pharynx, assisted by inspection, while the great majority of cases occur in children. Some form of cutting forceps is useful occasionally as an adjunct, but the curette is universally applicable. There is with this no danger of injury to the parts, while if vigorously operated, one sweep accomplished in the twinkling of an eye will, in most cases, remove all superabundant tissue from the naso-pharynx.

The Gottstein instrument is widely known and used. Gruber's curette is little known outside of his own clinic. The super-

iority of the latter is a matter of experience rather than of demonstration. I am confident it will be conceded by anyone who will give them both a fair trial. In an effective surgical instrument, simplicity is an important factor. The Gruber curette is simpler than the Gottstein. With its working part at right angles to the shank, the application of pressure in the proper direction is simplified and rendered more effective. There is nothing about its appearance to suggest a cutting operation to the patient. Its cutting edge, however, is most efficacious, and instead of being limited to the cross section, follows the loop throughout its entire circuit. In this particular its superiority to the Gottstein knife is evident. The latter, where the growth has a base too large to be enclosed in the loop, is compelled to do more or less dragging and tearing at the sides, and the growth is much more apt to be left hanging in the throat by an undivided portion.

With the Gruber curette, which is essentially a ring-knife, it comes away clean. Again where the growth is large and more than one application is necessary, by directing the curette first to one side and then to the other, the top of the loop which is circular, fits approximately into the sulci on either side of the vomer accomplishing all that was intended by the Politzer instrument. It was, I believe, the original design that the instrument should be operated, as a rule, in this way, and to that end Prof. Gruber had it made in three sizes. This may sometimes be found an advantage, but in the large majority of cases, the one size as made for me by Tiemann & Co., upon a model brought from Vienna, applied in the middle line will be found more practicable. The thick and rounded shoulder prevents any contact of the edge with, and hence, any injury to the Eustachian orifices. The loop of the instrument is about the same size as that of the Gottstein and will remove an equal amount of tissue, doing it more easily and smoothly.

My attention was first directed to this curette by seeing it used in Prof. Gruber's clinic at Vienna, by Dr. Müller, assistant to both Professors Gruber and Politzer. With abundant opportunity for testing the comparative merits of the three instruments here described, he declared with enthusiasm for the Gruber. My own experience has been a similar one, and I feel confident that a trial will commend it to the favor of the profession.

REPORT ON PROGRESS—OPHTHALMOLOGY

REVIEW OF CURRENT AMERICAN AND ENGLISH OPHTHALMIC LITERATURE.

By CHARLES H. MAY, M. D.,
OF NEW YORK.

CONCERNING THE HISTORY OF THE DISCOVERY OF REFLEX
OCULAR NEUROSES, AND THE EXTENT TO WHICH
THESE REFLEXES OBTAIN.

S. Weir Mitchell, M. D., Philadelphia—*Medical News*, April 28, 1894.

Dr. Mitchell's article is a very interesting one on account of the delightful style in which it is written, because it contains many historical facts, and because it presents a perfectly fair statement of the position which the great majority of oculists and neurologists hold on the question of heterophoria in its relation to certain neuroses.

Dr. Mitchell believes that Dr. Ezra Dyer, Philadelphia, and Dr. J. Haskett Derby, Boston, "were the first Americans to bring us home from Germany modern views as to the corrections to be accomplished in disorders of the optic apparatus." From 1862 to 1864 he saw cases of headaches due to ocular troubles with Dr. Dyer. In the *Medical Reporter*, 1874, he described headaches due to eye-strain; these cases were corrected by Dr. Thomson. In the *Am. Journ. Med. Sci.* for April, 1876, he again wrote on the subject announcing certain conclusions, "having learned that not only headaches, but vertigo, nausea, anemia, and much disturbance of the general health might be due to difficulty of the eyes." He finds it difficult to understand Stevens' claim on p. 8, of *Functional Nervous Diseases* (published in 1887), that "no general principle of sympathetic or reflex irritation had, however, been formulated, and the first *printed* announcement of the existence of such a principle was made by myself (Stevens), in a paper presented to the Albany Institute in the early part of 1876." Mitchell mentions a paper by Stevens in the *New York Medical Journal* for June, 1877, "Light in its Relation to Disease," and presumes this is the same as the one presented to the Albany Institute, December 19, 1876.

He concludes his paper with an able presentation of his views on heterophoria as a causative factor of certain reflex ocular neuroses, especially chorea and epilepsy, as follows:

“Before leaving the subject I would like to say a few words as to the more recent claims made by Drs. Stevens and Ranney. Men who run into extremes are often those who in the end teach proportioned wisdom to such as know wisely to profit by the excesses of others. This is going to be the case in regard to the extreme views enunciated by these two gentlemen. There is in them an element of occasionally useful truth. Where they appear to me to have most distinctly failed I have endeavored to point out to the best of my ability.

“At my clinic, for two years or more, Dr. G. E. de Schweinitz examined with the utmost care the eyes of all of the numerous choreic children who appeared at the Infirmary for Nervous Diseases. The cases extended to one hundred, and although many of them have been given the most careful attention, I do not think that any notable good in the way of cure of chorea was obtained by correction of refractive or other errors. In the disorder I first described as ‘habit-chorea,’ glasses have now and then been found to be useful, but not always; nor should we expect to find anything else in regard to chorea proper. It is largely a disorder of seasons in the first place, and secondly it is a disease easy enough to treat. The great mass of cases get well without much difficulty; in a large number of instances the disease is self-limited, and gets well if let alone, nor has it the gravity which one would be led to expect from reading Dr. Stevens’ early paper. Dr. deSchweinitz, will, I am sure, entirely agree with the conclusions I have reached as being his opinion and mine, to the effect that we have gotten no good by correcting the eyes in cases of chorea. I came to this matter with a perfectly free and unbiased mind, but this was the end. Choreal children with ocular defects got well under arsenic alone quite as soon as others who had no like disorder of vision; or the choreas got well, and the hypermetropia remained unaltered and unglassed.

“And now as to epileptics I have met with no better fortune. As regards this, I have read with care the conclusions of Stevens and Ranney, and have wished I could have seen some of the epileptic persons whom they so successfully treated. Those who have treated epilepsy know that in some respects it is a very curious disease. If we take an obstinate epileptic case and put it suddenly under new conditions, in a new place, with altered diet

and different surroundings, we occasionally find marked changes for the better, which are usually temporary. This is frequently the case at the infirmary. When an habitual epileptic is put there for the purpose of being watched, in order to determine the quality of the spasm, weeks and even months may pass without the patient having an attack, when before this they occurred every day; and this, too, despite the discontinuance of all drugs. I know of two cases of men who had such attacks before entering the army, and under the new surroundings were entirely freed from them. These are the things which make neurologists careful in concluding for the value of a new agent in this sad malady until the cure has lasted a long while, and been observed with care. Still, there are cases found in Ranney's last contribution ('Eye Treatment of Epileptics,' *New York Med. Journ.*, Jan. 13, 20, and 27, 1894) which seem to have ended in cures. I can only say that I have failed to obtain like results in our own attempts to cure epilepsy by the correction of refractive errors or by cutting tendons. I neither believe nor disbelieve. When I can see two or three cases of cure of undoubted epilepsy by tendon-clipping, I shall want to recommence. So far I have had only disappointment, and others here who began to cut tendons with enthusiastic hope, have, like me, got no good for their patients out of an industriously acquired experience in this direction. I shall be but too happy to drop the dubious mood in which I am as to this whole matter.

"I believe, as regards tenotomy *versus* prisms, that these gentlemen have taught us a lesson which we may with moderation usefully employ. I have called your attention to the matter because I am well assured that if, as to tendon-cutting, the gentlemen whom I have so frankly criticised have gone too far, you, I think, have not gone far enough.

"I have tried as to this whole matter to be fair and courteous, and yet to set the history right. As concerns too positive views of treatment, time alone will entirely settle these.

"And now a word or two as to your own relations to the disorders in which we see ocular troubles, or as to those in which these are the cause of symptoms.

"I trust the day has gone when you will put on prisms, or cut the tendons of atoxic cases without perceiving the special source of the defects; but a more lasting evil arises out of the fact that sometimes you do not comprehend the fact I have long tried to teach, that eye-strains lasting through the years of development may make permanent headaches which no glass will do more than partially relieve.

“Again, you often see people who owe to ill health a suddenly intensified capacity to feel an eye-strain. You glass them and expect too much. Neither you, nor any specialist, can, or should, escape from a sense of larger responsibility, and if you cannot hold your patient when you have corrected the eyes, it is imperative that he learn from you the fact that he needs more than merely the best correction of the eyes. A careful study would often tell you that a man may have two or three different forms of headache, and that it were well to understand that while your glasses may cure an occipital ache, for instance, he may still continue to have neuralgic hemicranial pain, or an occasional attack of gouty headache.

“I suspect that our own oculists are far in advance of the English and most Continental surgeons, in the care with which they correct defects in refraction. I fancy that they sometimes fail to get the best possible results because of difficulties due, it may be, to personal peculiarities in patients, or sometimes to the belief that slight muscular defects may be let alone when the refraction has been accurately corrected.”

PARALYSIS OF THE SUPERIOR RECTUS AND ITS BEARING ON THE THEORY OF MUSCULAR INSUFFICIENCY.

Dr. A. Duane, New York—*Archives of Ophthalmology*, April, 1894.

Dr. Duane believes that paresis of the superior rectus and indeed of all the eye muscles is much more frequent than has been heretofore supposed. He himself has seen six uncomplicated cases of paresis of the superior rectus and four others in which, although a complication existed, the complication had obviously no etiological connection with the paresis. He presents a tabular report of these and five other cases, exhibiting the symptoms, course, and treatment. The symptoms are comparatively slight, being mostly due to the exophoria which is the necessary consequence of the paresis of an adductor such as the superior rectus is. For treatment he recommends in extreme cases advancement of the paretic muscle, or, if the affection happens to be associated with esophoria, tenotomy of the superior rectus of the other eye. In other cases prisms correcting the exophoria and hyperphoria may answer all requisites. The most rational treatment, however, is to remedy the exophoria by training the adduction with prisms until the patient can use his interni at all ranges with facility. In many cases the symptoms are too slight to require any treatment. These cases all occurred in young people and without any apparent exciting cause, and the author is inclined to look upon them as of con-

genital origin. He further regards them as of significance in the bearing they have upon the theory of heterophoria. The latter condition, he argues, being really, as von Graefe called it, a latent squint, should be divided into the same categories as a manifest squint; and we ought not to think of attempting to treat a heterophoria until we have ascertained, as we can do in almost every case, whether it is due to the anatomical disposition of the parts (concomitant heterophoria), to paresis, to spasm, or to excess or deficiency of accommodative effort. In his own experience, concomitant heterophoria has appeared to be the most frequent variety, although parietic heterophoria is quite common; spastic heterophoria is less frequent, although not so very rare; and accommodative heterophoria, or the kind which can be remedied by glasses, is comparatively infrequent.

ON THE BLINDING OF THE RETINA BY DIRECT SUNLIGHT—
A STUDY IN PROGNOSIS.

George Mackay, M. D., F. R. C. S. E.—*The Ophthalmic Review*, January, February and March, 1894.

The writer summarizes the data for prognosis as follows: 1. The time which has elapsed since the accident. 2. Degree of impairment of visual acuteness for test type and colors. 3. Extent of scotoma and especially of absolute area. 4. Gravity of ophthalmoscopic changes. 5. Presence or absence of oscillating movement. 6. Of metamorphopsia. 7. Local and general healthiness of subject. 8. Refraction of the eye. 9. Natural pigmentation of the fundus. "An uncorrected ametropia and a fundus rich in pigment may confer some protection."

In cases in which the eye has previously been healthy and the vision normal, he divides the cases into four classes:

Class I. V. = $\frac{1}{3}$ or better in the *first week*—good chance of practical recovery in one month.

Class II. V. = $\frac{1}{3}$ in the *second week*—fair chance of practical recovery in three or four months.

Class III. V. = $\frac{1}{3}$ in the *third week*—will probably recover slowly in five or six months, but chances are against complete restoration.

Class IV. V. poorer than $\frac{1}{3}$ at any time, though rapid progress in first month—poor chance of recovering V. of $\frac{6}{6}$. "Hitherto no case with V. poorer than $\frac{1}{3}$ has regained $\frac{6}{6}$." By "practical recovery" he means cessation of obstructive defect.

Treatment should be preventive. "A glass so dark that no

object illuminated by diffuse daylight is visible through it, must at least be used if one would view even the January sun with impunity. One should also give time for gradual adaptation of the retina, and test the suitability of the glass by looking through it first at the sky near the sun; and so soon as one has looked directly at the sun for a second or two it is well to look away altogether and see if there is any persistence of the impression. If any is found, the tint of the glass must be deepened." As to treatment after the injury, he advises protection from great alterations of light by the constant use of dark glasses (No. 3 London smoke with side pieces), rest from eye work during the first month and attention to the general health. If inflammatory symptoms threaten, diaphoretics and confinement to darkened room. He does not believe that any good results from the use of strychnin hypodermatically or galvanism, cases having improved as much and as rapidly without as with either.

LOCAL OCULAR THERAPEUTICS BY SUBCONJUNCTIVAL INJECTIONS OF SUBLIMATE.

Dr. A. Darier, Paris—*The Ophthalmic Review*, April, 1894.

Darier has adopted this treatment of ocular disease for several years past. In localized infection when surgical treatment, such as the cautery, is not feasible and the lesions are not superficial he advocated the injection of sublimate into the infected focus or into the surrounding parts. He advocates the use of this method in sympathetic ophthalmitis and claims efficiency in cases of his own and of others. Good results have followed this method in secondary, late traumatic and in post-operative infection; it is of great usefulness in infecting ulcer of the cornea. Even in diseases of the deep-seated membranes of the eye (irido-choroiditis, retinitis, neuritis, etc.) he claims these injections have, in many cases, given astonishing results. At the last Congress of Ophthalmology, Dr. Pilueger of Bern, confirmed Darier's results, especially in affections of the choroid. Darier has found subconjunctival injections remarkable in their action in cases of choroiditis or chorio-retinitis when central, recent and not too deep. He speaks of a series of successes in certain cases of infectious retrobulbar neuritis. In grey spiral atrophy of the optic nerve, the results were *nil*; in white atrophies following old inflammatory processes, slight improvement of vision has resulted.

Good effects followed these injections in cases of traumatic affections of the iris and ciliary body characterized by iritis, irido-

cyclitis or even irido-choroiditis. Many cases of gummatous iritis got well rapidly under this plan of treatment, also obstinate cases of irido-choroiditis. Darier has come to the conclusion that these injections are contra-indicated, momentarily at least, when circulatory stasis renders absorption of the medicine difficult or impossible.

[The usual hypodermatic syringe with a flattened platinum needle sterilized in the flame before use, may be employed for these injections. Dose, $\frac{1}{20}$ mg. (0.00005 gram) at one sitting. The puncture is made 1 cm. from the corneal margin, the eye being cocainized, and gentle friction is applied. The pain following the injection varies and is sometimes rather severe. The next day there is much redness and swelling of the conjunctiva; after three or four days the eye will have recovered sufficiently to permit a second injection. C. H. M.]

OPTIC NEURITIS AS A SIGN OF BRAIN TUMOR.

William H. Wilder, M. D., Chicago—*Chicago Medical Recorder*, May, 1894.

With a view of ascertaining what value can be ascribed to optic neuritis as a diagnostic sign in cases of brain tumor, in localizing or in giving evidence of the nature of the lesion, Wilder examined all the accessible literature of the past four years and collected all published cases of intracranial tumor on which a surgical operation or an autopsy had been performed. He obtained 161 cases; thirty-seven of these had been operated upon with a mortality of about 65 per cent. From a study of these cases there results a very interesting paper which concludes as follows:

“The conclusions derived from the study of these cases are against the theory that intra-cranial growths bring about optic neuritis by an increased pressure within the skull; for tumors no larger than a hazel nut may be accompanied by this condition, while others of immense size may encroach upon the brain without causing any trouble to the eye.

“It seems probable that those tumors which cause the most irritation either to the brain itself or to the meninges are the ones that most frequently give rise to this symptom. The malign influence may operate either by bringing about a descending inflammation of the nerve fibers, as suggested by Gowers, or by carrying through the fluids in the sheath of the nerve some morbid material as claimed by Leber.

“If these be double but unequal optic neuritis, the side on which the more intense inflammation exists is probably the side of

the lesion in the brain; similarly, the papillitis is likely to begin first, and the visual disturbance to be more marked in that side.

"The importance of early and repeated ophthalmoscopic examinations as well as records of the visual power and the condition of the fields for white and colors should be emphasized."

ON TESTS OF THE LIGHT SENSE OF THE PERIPHERY OF THE RETINA FOR DIAGNOSTIC PURPOSES.

Dr. Ward A. Holden, New York—*Archives of Ophthalmology*, April, 1894.

The light sense of the retina in ordinary illumination gradually decreases from the center to the periphery. Groenouw has suggested examining the visual field by means of a black point 1 to 4 mm. in diameter on a white ground. Holden finds that altogether similar results are obtained by using pale gray patches on a white ground and that both tests are tests of the light sense purely. In routine work two cards are used: One has a 1 mm. black point on one side and a 15 mm. quadrant of gray having four-fifths the intensity of white on the other. Each of these is seen inward 35° , upward 30° , outward 45° , and downward 35° . Standing two feet away from the patient and having him fix the finger held half way between, the card is moved in from the periphery until the oculist recognizes the spot on one side when the patient should see the patch on the other. The card is then reversed and the test repeated. Thus, as a check on the other, defects in the central zone of the retina are made out.

A second card with a 3 mm. black point and a gray patch having three-fifths the intensity of white is seen inward 55° , upward 45° , outward 70° , and downward 55° . This test is for the intermediate zone of the retina.

For the extreme periphery and to make out absolute defects, a white quadrant of 5 mm. of black may be used. These three tests may take the place of all perimetric tests including color tests, and by their use very slight disturbances of light sense may be determined and the diagnosis of fundus and optic nerve diseases be much facilitated.

IMMEDIATE CAPSULOTOMY FOLLOWING THE REMOVAL OF CATARACT.

L. Webster Fox, M. D., Philadelphia—*Journal American Medical Association*, June 2, 1894.

After describing the preliminary treatment essential in cataract operations and laying great stress upon the observance of many minute precautions, Fox describes the operation as follows:

“After delivery of the lens and all cortical matter is washed out of the anterior chamber, I proceed with the rupturing of the posterior capsule. The instrument used is a gold enameled hook made as delicately as is consistent with keeping its shape. It is of malleable steel so that it may be bent to any angle, which I find is convenient, especially when the eye of the patient lies deep in the orbit. The hook is passed into the anterior chamber, and behind the lower pupillary margin of the iris on its flat side. It is then rotated backward, hooked into the capsule, drawn gently upward to the mouth of the incision, rotated on its flat side again, and then taken out of the chamber. By this means the capsule is torn and the vitreous presses forward between the rent. Very little or no vitreous shows at the mouth of the wound. If it does, I snip it off.”

Fox has performed this operation in alternating cases for ten years. In patients thus operated upon, needling or capsulotomy (scissors) was necessary in 15 per cent of cases; where not performed in 75 per cent. He believes there is less danger of inflammation of the eyeball in immediate capsulotomy than in a subsequent operation.

A CAUSE OF FAILURE IN THE SURGICAL TREATMENT OF INTERNAL STRABISMUS.

Howard F. Hansell, M. D., Philadelphia—*Journal American Medical Association*, June 9, 1894.

Hansell speaks of certain cases of internal squint in which the eye is not only turned inward but is also *rotated inward and upward*, and says the oblique deviation has been persistently ignored. “The etiology of the upward deviation is precisely that of convergence. The third nerve supplies other external muscles besides the internal, and unless there is a peculiar relationship or connection, undemonstrated by the microscope, between the nuclei of the ciliary and interni muscles which does not obtain with the others, we would certainly and logically expect a response to the stimulus given by the accommodation to include the superior and inferior rectus and the inferior oblique, and not be limited to the internus and the iris. The rotation of the cornea in consequence of their combined action must be inward and upward.

“I earnestly urge, first, an examination and close analysis of the degree and kind of turning of the cornea by a study of the relative positions of the false and true image of a small gas jet or candle flame at 6 m. and shorter distances; second, a recognition of the

hypermetropia which will be invariably found to complicate esotropia, of its transference with the esotropia in concomitant or alternating strabismus; third, of the permanent upward deviation of the inward turned eye in constant squint; and fourth, emphasize the deductions taught by these conditions, namely, that the hypermetropia of the former disappears under correction of the error of refraction and tenotomy of the interni, and in the latter, vertical equilibrium can be obtained only by operation on the vertical muscles.

NOTES FROM FOREIGN OPHTHALMIC JOURNALS.

BY CASEY A. WOOD, C. M., M. D.,
OF CHICAGO.

STUDIES IN THE PATHOLOGY OF THE OPTIC NERVE. PATHOLOGY OF THE VARIOUS FORMS OF OPTIC NEURITIS. TWO CASES OF CONGENITAL OPHTHALMOPLÉGIA EXTERNA. SUBCONJUNCTIVAL INJECTIONS OF SUBLIMATE IN EPISCLERITIS. SPONTANEOUS CURE OF TRAUMATIC DETACHMENT OF THE RETINA. A CASE OF ASTIGMATISM CORRECTED BY ALTERATIONS IN THE LENS. LIFE AND WORKS OF QUAGLINO.

The first part of Sachs' studies of optic nerve pathology was published in an earlier number of the *Archiv* and mainly dealt with cases in which growing tumors, aneurisims especially, had exerted mechanical pressure upon the optic nerve and chiasma. A study of the changes thus brought about in the nervous structure is valuable, chiefly because it was found that the alterations were largely confined to the papillo-macular bundle and that they followed the winding course (long before mapped out by the writer, Uhthoff and others) pursued by that bundle on its way to the retina.

Why it is that retrobulbar neuritis (toxic and other) should by preference attack these particular fibers almost exclusively is not

very well determined. Sachs discusses these and other subjects in his second paper¹ in the light of autopsies and microscopical examinations of the parts involved. His study of toxic amblyopia is especially interesting.

Of Groenouw's 185 cases of toxic retrobulbar neuritis only two were in women; Uthoff has not a single woman among his 138 cases; Brauchli's cases, 144, were all in men; Sachs, however, discovered four women out of ninety-seven cases treated by him. Three of these indulged in both tobacco and alcohol, while the fourth did not drink. The author inclines to the belief of the English school, that it is tobacco and not alcohol that in the mixed cases causes most trouble.

Why is it, he asks, that so few hard smokers acquire toxic amblyopia? He believes that so long as the appetite remains good and the digestion is not impaired, the smoker may indulge with comparative safety, but the moment such an affection as chronic stomachic catarrh shows itself, the eyesight is endangered. This is what commonly happens with people who both drink alcohol and smoke tobacco. Alcohol is more prone to set up catarrh of the stomach than tobacco, and it probably acts as the *predisposing*, while the tobacco stands forth as the *exciting* cause of the resulting toxic amblyopia.

LIFE AND WORKS OF PROF. QUAGLINO.

The first two parts (double number) of the *Annali di Ottalmologia* for 1894 contain a very interesting biography² of the late Professor Antonio Quaglino, one of the fathers of Italian ophthalmology. Born in 1817, he began the study of medicine at the University of Pavia, graduating there in 1842. He became Flarer's assistant the next year and continued with him until he left for Milan in 1846, where he settled. He commenced the first of his numerous contributions to medical literature in 1846, with a paper on the operation for artificial pupil. In 1859, he published the first atlas of ophthalmoscopy that had appeared in Italy. The following year he was appointed professor of ophthalmology at Pavia. He translated Donder's classical work on accommodation and refraction. Sclerotomy, as a surgical treatment of glaucoma, is an invention of Quaglino's, and he was among the first to use calabar bean in the treatment of the same affection. For three

¹ Sachs-Weiterer anatomisch-klinischer Beitrag zur Kenntniss des Centralscotoms bei Sehnervenleiden., *Archiv. für Augenheilk.*, xxvii, 1.

² L. Guita e R. Rampoldi. *La vita e le opere del prof. A. Quaglino.* Anno. xxiii., Fasc. 1—2.

years he was Dean of the Medical Faculty of Pavia. In 1871 he founded the *Annali* and frequently contributed articles to that journal. In 1880 the International Medical Congress elected him as their president, and he had various other honors conferred upon him.

In 1881 he was still actively engaged in practice although 65 years of age. One day, while treating a patient suffering from acute purulent conjunctivitis, he contracted a violent ophthalmia which, in spite of careful treatment and nursing, resulted in almost complete loss of sight.

Although a few years before his death he was able to see a little he never again had anything like useful vision. As his biographers so truly say, it seemed the irony of fate "*colui, che aveva dato la luce a tanti, venneiva condannato alle tenebre.*" And so, last January, he died full of years and honors, leaving behind him a large number of former pupils and assistants who, well-known in the annals of Italian medicine, continue his work and keep his memory green.

TWO CASES OF CONGENITAL OPHTHALMOPLÉGIA EXTERNA.³

I have had occasion to observe two very interesting and extremely rare cases of congenital ophthalmoplegia externa occurring in the same family. These two cases are particularly noteworthy from the standpoint of hereditary antecedents as both the father and mother of the patients were entirely healthy. I believe that the publication of these two cases will attract the attention of the profession, and lead to further research in this direction.

Case I. Jean I., aged 25, gardener.

Hereditary and personal antecedents. Negative. His father, 45 years of age, is well; his mother, aged 50, has been entirely deaf for ten years. He has two brothers who are healthy and one sister who has the same lesion.

Actual condition. Dull, stupid expression, diminished memory, hemianesthesia of the right half of the head and deafness in the right ear. Congenital malformation of the index and little fingers of both hands which are disproportionately small. Syndactylism of the middle toes of both feet. Paresis of the sphincter of the bladder; examination of the urine revealed nothing abnormal.

Right eye. Marked ptosis of the right lid hiding two-thirds of the pupil; paralysis of the rectus superior, paresis of the rectus

³Gazépy. Deux cas d'ophthalmoplégie congénitale externe. *Archives d'Ophthalmologie*, Mai, 1894, p. 273.

externus, and in consequence internal strabismus of 25° and finally lagophthalmia as a result of paresis of the lower lid. General incomplete muscular action. Contraction and dilatation of the pupil to light physiological and no marked abnormality of accommodation.

Acuity of vision. — O. D., V. = $\frac{1}{8}$.

Examination of refraction. Myopia, four dioptries O. D., V. = $\frac{2}{3}$.

Ophthalmoscopic examination. Posterior sclero-choroiditis. No other lesion in the fundus of the eye.

Left eye. Ptosis of the upper lid; paresis of the rectus superior, rectus inferior, and rectus externus with strabismus of 35° , and finally lagophthalmia in consequence of paresis of the lower lid.

Pupil normal.

The patient can count fingers with the naked eye at a distance of three meters.

Examination of refraction. Myopia with astigmatism, O. S. Cyl. — 1, axis horizontal with spherical $4\frac{1}{2}$, V. = $\frac{2}{3}$.

Ophthalmoscopic examination. Posterior sclero-choroiditis. No other lesion of the fundus of the eye.

Case II. A. —. aged 18, servant, scrofulous. At the age of 12 she had an abscess in the left temporal region near the tragus, from which complete deafness of the left ear resulted. She still bears traces of the scar.

Actual condition. Memory diminished; complete deafness of the left ear. Congenital malformation of the index and little fingers of both hands which are disproportionately small. Syndactylism of the middle toes of both feet.

Right eye. Ptosis of the upper lid hiding two-thirds of the pupil; complete paralysis of the rectus superior, consequent inferior strabismus; paresis of rectus internus and consequent external strabismus of 20° . The pupil contracts and dilates normally to light and accommodation.

Acuity of vision. O. D., V. = $\frac{1}{2}$.

Examination of refraction. Myopic astigmatism; with concave cylinder, having horizontal axis of 1 D., V. = $\frac{2}{3}$.

Ophthalmoscopic examination. Nothing abnormal.

Left eye. Complete ptosis of the upper lid hiding two-thirds of the pupil; complete paralysis of the rectus superior with consequent inferior strabismus; paralysis of the rectus externus with consequent internal strabismus of 40° ; incomplete development of the lower lid and consequent lagophthalmia.

Acuity of vision. O. D., V. = $\frac{1}{3}$.

Examination of refraction. Hypermetropic astigmatism. With convex cylinder axis 135° , V. = $\frac{1}{2}$.

Ophthalmoscopic examination revealed no lesion of the fundus of the eye.

The father of these patients has a brother and sister entirely healthy whose children present the same conditions as these patients. We conclude then, having been unable to trace any hereditary connection from the father to the children, that this lesion is probably due to atavism, that is, transmission from the grandfather to the grandchild.

Unfortunately we have been unable to obtain any exact information as to the health of the grandfather.

EPISCLERITIS CURED BY SUBCONJUNCTIVAL INJECTIONS OF SUBLIMATE.⁴

I send you this letter to make known to the readers of the *Annales d'Oculistique* the rapid cure of a somewhat severe case of episcleritis by subconjunctival injections of sublimate, as M. Gallemaerts has already detailed a case in his report of the trial of this method of treatment in the clinic of our colleague, M. Coppez.

You asked me sometime ago as did also some of my colleagues, the result of my experience with subconjunctival injections of sublimate. I did not at that time accede to the request because I had obtained very contradictory results; in some cases remarkable success; in some, complete failure; sometimes an obvious aggravation of the condition of the patients, particularly in cases of acute iritis. Other clinicians have also recognized the inferiority of this direct application of mercurial treatment in acute inflammation of the uveal tract, as compared with other methods of administration of mercury, by the mouth, by inunction and by hypodermic injection.

At this time, after the repeated testimony of our colleagues, Darier, Dufour, Coppez, Chibret and many others, the utility of subconjunctival injections of sublimate need not be demonstrated. It still remains to clearly establish in what cases their success seems assured and by what mechanism the result sought for is obtained. In this way only can the more precise indications for their use be stated.

During my experiments I have been struck by the frequency with which the episcleral zone in which the injection has been

⁴Terson. Episclérite guérie par les injections sous-conjonctivales de Sublimé. *Annals d'Oculistique*, Mai, 1894, p. 347.

made, has rapidly assumed the aspect of an exudative plaque entirely devoid of vascularization, presenting all the appearances of an eschar of variable extent and depth. Henceforth, it seemed natural to me to attribute the failure of the treatment to the more or less violent local irritation produced by the remedy itself in the cases where a generalized inflammatory reaction of a certain intensity preexisted. From this was obtained a clear contra-indication of its employment in similar conditions.

I have noticed, on the other hand, that this almost complete suppression of vascularization in the zone of the subconjunctival tissue injected, persists for a long time, and since then have appreciated that we might utilize this powerful local action in cases in which exaggerated, but well localized vascularization of this tissue existed. The account of the case of episcleritis cured by injections of sublimate contained in the report of M. Gallemaerts convinces me that our Belgian brethren have already put this idea into practice under the influence perhaps of considerations of another kind. Although this may be the case, this success should not surprise us. Does not episcleritis present quite characteristic signs, infiltration wholly localized in that point of the subconjunctival tissue which we can directly attack with injections? Have we not already sought, often with success, to eradicate this abnormal vascularization by the thermo-cautery or by scarifications, not hesitating to cauterize or to incise the healthy conjunctiva with the sole object of reaching the subjacent affected tissue?

The following case goes to support the preceding considerations:

Mme. B. —, a very rheumatic subject was attacked four months ago by a typical episcleritis, accompanied by extreme pain, without any complicating iritis, but with slight sclerosis of the portion of the cornea corresponding to the infiltrated scleral area. Warm local applications, anodynes, sodium salicylate and iodid of potassium had no influence on the progress of the disease. Although the treatment was followed out assiduously, the inflammation yielded at one point only to appear at another, always accompanied by intense pain.

A somewhat extended plaque of scleritis existed in consequence of two unexpected relapses within a short time. I thereupon gave an injection of two minims of a 1 to 1,000 sublimate solution in the immediate vicinity and a little posterior to the seat of greatest inflammation. The injection was followed by a strong reaction which lasted three hours, but after the following day the pain disappeared and with it the vascularization of a portion of the.

episcleritic tract into which the injection had penetrated. A week later a second injection was made at a point farthest removed from the inflammatory focus, and this was also followed by amelioration. A third injection a week later definitely suppressed all vascularization in the affected region, and completed the cure which has been permanent for more than three months, as has been verified by the patient's occasional visits. The eye presents only a slight trace of peripheral corneal sclerosis which does not interfere at all with her vision.

This is the case which I desire to communicate to my colleagues, to induce them to experiment with subconjunctival injections in an affection of which little is known and which often resists the most apparently rational treatment.

Is the effect of the injection on the subconjunctival tissue more intense when the patients are at the same time under general iodid treatment? Would it cause a more accentuated eschar upon the spot, by reason of a chemical combination of these two agents, similar to that produced on the surface of the conjunctiva by the insufflation of calomel when the patient is taking iodid of potassium by the mouth? This is a question to be settled by observation of cases.

I have not tried subconjunctival injections of sublimate in cases of deep scleritis or of anterior sclero-choroiditis which are ordinarily complicated by more or less acute iritis, and which, therefore, present a serious contra-indication to the employment of this method of treatment.

A SPONTANEOUS CURE OF TRAUMATIC DETACHMENT OF THE
RETINA.⁵

Cases of spontaneous cure of detachment of the retina are very rare, and many busy practitioners, even after years of special practice in ophthalmology, have never seen a case. In 1886 our society, (*Société française d'Ophthalmologie*), sent out forms to all its members in order to clear up the important question of retinal detachment from the three-fold standpoint of etiology, pathogenesis and treatment. The reason for making this inquiry was a communication from Dr. Dransart, who, I must say, surprised us by the number of recoveries which he had obtained after iridectomy.

This attempt of our society, notwithstanding the great interest attaching to one of the most important questions of ocular path-

⁵ Nouvelle observation de guérison spontanée de décollement traumatique de la rétine. *Recueil d'Ophthalmologie*, Mai, 1894, p. 257.

ology met with only partial success, as our reporter, Dr. Poncet, remarked that of 160 members to whom the inquiry had been sent, only twenty-nine had seen fit to respond.

Of the 398 cases reported by our colleagues, seventy were of traumatic origin, and in the column for observations in the question form no mention was made of a cure by iridectomy or by any other means. "This silence," adds our reporter, "clearly indicates to us that the detachment of the retina has nothing to expect from surgical treatment." But as spontaneous cure was not mentioned at all, I conclude that it must be extremely rare.

In my opinion, although the contrary has been said, traumatic detachment does not at all resemble other detachment, for, besides the fact that it is produced for the most part in eyes previously healthy, it is generally accompanied by inflammatory phenomena which cause more or less rapid resorption of the liquid poured out upon the retina. It is, perhaps, due to this circumstance, and in many cases to a failure to thoroughly examine the fundus of the eye for several days after the traumatism, that a certain number of partial detachments of only temporary duration have escaped the notice of the observer, and have, therefore, diminished the proportion of spontaneous cures.

I published several years ago a case of spontaneous cure of retinal detachment following an iritis which occurred years after the appearance of the disease; to-day I shall report to you a case of spontaneous and rapid cure of traumatic detachment with entire absence of local or surrounding inflammation:

CASE. September 10, 1893, a child, aged 9, was brought to me who had three days before received a wound in the left eye from a wooden arrow. Examination of the eye revealed at the internal portion of the cornea, about 3 mm. from the border of this membrane, a vertical contused irregular wound 4 mm. in length, between the lips of which the vitreous humor escaped. The physician who sent the little patient to me said in his letter that after the accident a quantity of the vitreous humor escaped. The iris was largely dilated and immobile and a hyphema 3 mm. in height occupied the base of the anterior chamber, the depth of which appeared normal.

The vitreous body was very turbid and did not permit the fundus of the eye to be seen. The crystalline lens was also not quite transparent and appeared to be slightly luxated inwards. Apparently no pain nor inflammation. Fingers could be counted with this eye at a distance of 30 cm.

I prescribed simply a boric lotion and a permanent wadded bandage.

Eight days later I saw the patient again. The sclerotic wound was closed and the extravasation resorbed, but the entire vitreous body was infiltrated with blood, so that the vision was not so good as at the first examination.

September 24th all the blood in the vitreous body had been resorbed and the central portions of the eye were entirely transparent. The vision had improved, but a large scotoma existed in the external visual field corresponding to a somewhat extended detachment of the retina, situated on the level of the sclerotic wound. Ever since the accident the pupil had remained largely dilated and immobile.

I now prescribed a collyrium with pilocarpin intending to make in a few days puncture and aspiration of the subretinal fluid.

October 1st. The eye and the vision were unchanged. V. = $\frac{1}{5}$ and the same treatment was continued.

November 5th. On examining the patient what was my astonishment to be unable to find the detachment of the retina which had been so clear and evident a month before. As the pupil was still greatly dilated I was able to entirely explore without mydriatics the entire surface of the retina with the ophthalmoscope and was convinced that no trace of the detachment remained.

At the site of the detachment I found only a large pigmented spot situated at the level of the sclerotic wound. The scotoma had almost entirely disappeared, but the mydriasis remained the same. Notwithstanding this, the vision had again improved and with a plain cylinder $+1$, horizontal axis, a visual acuity equal to $\frac{5}{5}$ could be obtained.

Since that time I have seen the child several times; the vision and the mydriasis remain the same, and to-day, after eight months have passed, no traces of the wound can be seen, and the vision has improved so that there is no notable difference between the eyes.

This case brings up many interesting points besides that of the spontaneous cure of detachment of the retina which took place in a few weeks and without medication. These are first, the violence of the traumatism and the irregularity of the wound produced by the blunt arrow. Notwithstanding these defective conditions and the outflowing of blood into the vitreous humor, the wound united, we might almost say by first intention and not the least internal or external inflammation of the eye resulted.

The seat of the wound was in the ciliary region. This location,

according to all authorities, imparts an extreme gravity to wounds of the eye, and I have not infrequently observed atrophy of the eye, irido-choroiditis and sympathetic ophthalmia due to no other cause than this. It would, perhaps, be rash after eight months to shout victory and to affirm that nothing untoward will occur in this eye, but its actual aspect gives one little reason to fear ulterior complications.

I have in my possession many similar facts, one of the most interesting of which I reported to you three years ago in which an eye had been literally burst in a fall by a vine-shoot which caused a circular peri-corneal wound nearly 2 cm. in length. Since I reported the case to you there has not been the least change in the wounded eye which has always appeared normal, and which has never since the accident, which occurred four years ago, been the seat of the least pain.

Finally, I desire to point out one peculiar feature to which I have already referred, namely, the persistent mydriasis which followed the injury and which no myotic has been able to make disappear even for a moment.

This persistent mydriasis is frequent in lesser injuries to the eye and no influence upon visual acuity and accommodation. I also observed two years ago a young girl who received a slight blow in the eye from the branch of a tree, following which considerable dilatation of the pupil occurred I immediately employed to combat this mydriasis all known means, but without effect. Notwithstanding this dilatation of the iris, accommodation remained normal and was unchanged when I last saw the patient some months ago. The same fact was noticed in the case of the young child which I have just reported. This dissociation of contractility in the ciliary muscle and in the iris which are both supplied by the same nerve, demonstrates that traumatic mydriasis should be considered as dependent upon a peripheral and terminal alteration of the ultimate branches of the common ocular motor nerve which is distributed to the iris, but which is not improbably a distinct nerve having separate fibers from the iris to the nucleus of origin of the third pair from which they are derived. I do not insist more on this fact which I think, nevertheless, should be noted in passing, but the discussion of which would be a digression from the subject which I have considered in this brief communication.

A CASE OF ASTIGMATISM CORRECTED BY ALTERATIONS IN
THE LENS.⁶

Do astigmatic contractions, corrected by or associated with the lens, exist?

In his memoirs of ophthalmometry, Javal first answers: "We think that in a certain number of eyes, but exclusively in those persons who use their spherical accommodation there exists a compensatory astigmatic correction of the corneal astigmatism."

Unfortunately, a few lines further on, in small type we find the following *amende honorable*: "It often happens that we admit wrongfully the existence of astigmatic accommodation. The most of the cases of this accommodation are so obscure that two of our collaborators, MM. Geo. J. Bull and Tscherring are far from sharing our opinion."

If the faith of the Master may be shaken what would become of that of his disciples? "Do you believe in astigmatic contractions?" MM. Bull, Tscherring, Sulzer answer me: "No." To the following question: "Do you deny their existence?" They again answer. "No." They await a convincing case. The following case will, I think, convince them:

In May, 1880, I examined M. Izarn for refraction. I found O. D. emmetropia $S = 1$. O. S. $90^\circ - 1 - 2$, $S = 1$. In 1888, the O. D. was attacked by a slight keratitis which necessitated occlusion for eight days. When the patient desired to resume the use of the eye he ascertained the existence of an astigmatism which had not previously existed. My examination verified an astigmatism of -1 in the O. D. formerly emmetropic. Thus the development of an associated astigmatism in the emmetropic O. D. was produced while this eye was covered and the O. S. was obliged to do the work of both, and consequently should have tended to correct its astigmatism; besides this, a few days later, the associated astigmatism of the emmetropic O. D. disappeared by the use of the eye and M. Izarn returned to his former condition.

M. Izarn is now 51 years of age. For a considerable time I had been surprised to see that he neither needed nor used presbyopic glasses. I thought that he used the left eye exclusively and that thanks to the inverse compound myopic astigmatism he could read as he did apparently without difficulty or fatigue.

In conversation with him, I asked him certain questions and was

⁶ Chibret. Un cas de correction astigmatique du cristallin. *Archives d'Ophthalmologie*, Mai, 1894, p. 275.

astonished to learn that he utilized both eyes simultaneously for near vision. This was denied by me and affirmed by him. The following examination cleared up the mechanism of this strange vision.

M. Izarn read easily with both eyes open and fixed upon the paper at 28 to 36 cm. If the emmetropic O. D. was covered he could read only with difficulty with the astigmatic myopic O. S. This difficulty in reading indicates that the compound myopic astigmatism was not corrected. In fact this eye could see the vertical lines better at 28 cm. and the horizontal lines better at 36 cm., these distances corresponding the first to a refractive force of 3.50 D., the second to a refractive force of 2.75 D. Then being given the known refraction of this eye, which is $90^\circ - 1 - 2$, there is a manifest astigmatism of 0.75 D. with the employment of an accommodation of 0.75 D.

When the astigmatic myopic O. S. was covered the reading of the emmetropic O. D. was not possible and could only be attained with + 2 D. which permitted equally clear vision of the horizontal and vertical lines. Therefore this eye had simple presbyopia and not associated astigmatism. In brief, clear vision when both eyes were open and fixed on the paper; manifest astigmatism of the O. S. when the O. D. was covered; presbyopia of the O. D. when the O. S. was covered.

Upon completing the proofs by reading with the interposition of Javal's contrôleur, it was ascertained that with the myopic astigmatic O. S. he could read very well with or without the contrôleur and could see equally well the vertical and horizontal lines at distances from 28 to 36 cm.; that with the emmetropic O. D. he could not read at all the parts of the print for which the rule required covering of the myopic astigmatic left eye, but that he could read well with + 2.

The ophthalmometric measures were taken with care by the Javal and Schiötz ophthalmometer made by Laurent.

O. D. — 44.50, $165^\circ + 0.50$.

O. S. — 44.75, $85^\circ + 0.30$.

Upon fixing the subject at 10° outside and to each side of the axis of the glasses in the two principal meridians we ascertained that the ophthalmometric measures did not vary from those above given by more than 0.50 D.

We ought not, therefore, to call upon deformities or corneal irregularities for an explanation of the phenomena of astigmatic correction as previously studied.

A single conclusion is to be deduced from the observation of these phenomena: The myopic astigmatic O. S. corrects its astigmatism and can only correct it when the emmetropic O. D. receives luminous impressions at the same time; if this eye ceases to be excited by light the astigmatic correction of the O. S. is no longer effected.

Under such conditions how can we correct astigmatism? It can be due only to two causes, either to astigmatic contraction of the ciliary muscle or to a greater contraction of the pupil of the astigmatic left eye. We know, indeed, that the pupil of the eye reacts more to light when the other eye is simultaneously affected. Now it is easy to put out of the way the influence of light upon the pupil; it is, indeed, sufficient to lessen the light by reducing it to a minimum. Under these conditions, M. Izarn with both eyes open and fixed upon the paper, saw well and even better, notwithstanding the reduction of the light, than with a strong light. Therefore the pupil could not have a corrective action on astigmatism.

Consequently we are forced to admit that this astigmatism is corrected by the action of the ciliary muscle alone.

In addition it is allowable to deduce from this case another very interesting conclusion: namely, that associated astigmatism may exist and disappear in the same individual according to circumstances. M. Izarn really had in 1888 an associated astigmatism of the emmetropic O. D. from the sole fact that he was obliged during several days to utilize the astigmatic left eye only and to correct its astigmatism. Now he continually corrects the astigmatism of his O. S. for near vision, and, nevertheless, the O. D. did not present more associated astigmatism than before. Habit rendered possible the dissociation of the accommodative sympathetic correction.

The transitory associated astigmatism of M. Izarn confirms the law of accommodative synergy by which both eyes are bound, but the latter part of the report demonstrates also that this law is not absolute or that the same subject may disobey it after having conformed to it.

In publishing this case I do not wish to conclude that the correction of astigmatism by the lens is the only physiological method of correcting astigmatism. On the contrary I believe that in most cases contraction of the pupil or winking intervenes, but it seemed to me useful and interesting to publish the report of one case in which the ciliary muscle alone effected the correction of the astigmatism.

In conclusion I add, that M. Izarn who is an extremely nervous subject and very sensitive to pain and to fatigue is never inconvenienced by the astigmatic effort which he has to sustain. Also I had never thought to propose to him a correction which would have been very disagreeable to him, and which is in all cases entirely useless. I consider it prudent in such cases to limit the application to those astigmatics alone who consult me for the correction of astigmatism on account of inability or inconvenience.

OTOLOGY.

NOTES FROM FOREIGN OTOLOGICAL JOURNALS.

By T. MELVILLE HARDIE, B. A., M. D.,
OF CHICAGO.

PROFESSOR OF LARYNGOLOGY AND RHINOLOGY, POST-GRADUATE MEDICAL SCHOOL; PROFESSOR OF OTOTOLOGY, COLLEGE OF PHYSICIANS AND SURGEONS; ASSISTANT SURGEON EAR DEPARTMENT ILLINOIS CHARITABLE EYE AND EAR INFIRMARY; LARYNGOLOGIST AND OTOTOLOGIST, ST. ELIZABETH HOSPITAL.

THE OPERATIVE TREATMENT OF CHOLESTEATOMA— REINHARDT.¹

In sixty cases in which the antrum was opened Reinhardt found cholesteatoma nineteen times and of these he treated fifteen with the persistent retro-auricular opening. In those cases in which the wound behind the ear closed a new formation and disintegration of skin took place, whereas, in those with the persistent opening this danger never arose.

The operation is begun by opening the antrum; and the meatus, tympanic cavity, auditus, and antrum are converted into a single cavity according to Stacke's method, slightly modified. After thorough cleansing of the cavity, it is kept permanently open; first, by

¹For the notes of papers read in the Otological Section at the recent Eleventh International Medical Congress in Rome, the abstractor is indebted to the *Journal of Laryngology* for May and June in which a complete report of the proceedings in the Section appears.

the introduction of flaps from the side of the head; second, by transplantation from animals in suitable cases; third, by taking flaps from the posterior surface of the concha. By this last method the growth of hairs into the cavity is prevented. Cosmetic results were not considered.

Politzer and Dundas Grant did not think the persistent opening an absolute guarantee against recurrence.

ABSCESS OF FIXATION IN OTOTOLOGY.

Dr. Henri Colladon's conclusions were: 1. Acute suppurative otitis media may be terminated by the formation of a diffuse external otitis, the cure of which at the end of three or four days is followed immediately by the cessation of the otorrhea and cicatrization of the perforation.

2. This external otitis "of fixation" may be artificially induced by the injection and instillation of irritant antiseptics, *e. g.*, thymic acid.

3. Medication by fixation is very efficacious in acute and sub-acute otitis media purulenta. It should be made the subject of experiment in chronic cases.

Dr. Colladon's conclusions were not concurred in by all; Cozzolino and DeRossi considered an external otitis as a regrettable complication.

APPARATUS FOR THE GYMNASTICS OF THE DRUM AND OSSICLES.

Dr. Kirchner, (Würzburg), has given to his poor patients the instruments here described:

An India rubber tube 45 cm. in length, furnished with a tip to fit into the ear and an olive-shaped mouth piece. In the middle of the tube there is a globe of strong glass about $1\frac{1}{2}$ cm. in diameter in the cavity of which is a mass of absorbent cotton which serves as a filter. A little piece of gauze is used to make the meatus tip airtight and to prevent pain upon its introduction. The apparatus is a substitute for the Siegle otoscope or Delstanche *rarefacteur*.

THE THERAPEUTIC VALUE OF EUROPHEN, ALUMNOL, DIAPH- TERIN AND ANTISEPTIN IN SUPPURATION OF THE EAR.

Dr. Szenes, (Budapest), tried these drugs in eighty-six cases. Diaphterin in eighteen cases caused a burning sensation which lasted five minutes. In five cases of diffuse otitis externa, as also in nine cases of chronic suppuration of the tympanic cavity it at

once caused an increase of the secretion. Antiseptin was tried on sixteen patients, and despite its strong recommendation as an antiseptic in tubercle and syphilis he had an unfavorable report to give about it also. Euophen proved to be an antiseptic dusting powder in suppurations of the external meatus. It adheres to the wall of the meatus and decreases the secretion. It did not so act in suppuration of the tympanum. It is not dissolved in the pus. Alumol was used in thirty-eight cases; caused a burning sensation in three patients only. In slight suppuration it possesses the property of forming with the pus stony concretions, a peculiarity which condemns it. In twenty-four cases of chronic tympanic suppuration with profuse discharge no formation of the concretions was observed, but the condition remained unaltered in spite of the daily repetition of the treatment for eight days. It was therefore given up.

ON THE EXTRACTION OF THE AUDITORY OSSICLES.

Dr. Ludewig, (Hamburg). The diagnosis of caries of the hammer and anvil is often uncertain. Even the breaking of granulations through the membrana flaccida is no certain sign. Destruction of the upper posterior quadrant of the drumhead indicates more certainly caries of the incus. When a chronic middle ear suppuration continues in spite of treatment lasting more than a month by syringing through the catheter and the ordinary treatment through the meatus, extraction of the hammer and incus is done through the meatus. Incus-caries was found in 85 per cent of the cases. To control bleeding a subcutaneous injection of *secale cornutum* in front of the tragus and behind the auricle, is recommended. Styptic solutions are to be avoided. When extracting the incus attention must be given to a process of bone found over the entrance to the antrum on which the incus hook is apt to catch. In his last fifty cases Ludewig had no fever, facial paralysis, marked vertigo, or other injurious complication.

Discussion: Politzer. Extraction of hammer and incus is done by him only when the greater part of the drumhead is destroyed, and also when there is cholesteatoma in the attic. In perforation of the membrana flaccida when suppuration is limited to the attic and hearing power nearly normal, the hearing becomes diminished by extraction of the ossicles, and operative interference should be limited at first to opening of the outer attic.

Ludewig replied that in his fifty cases he had not once seen any diminution of the hearing power produced by the operation. It was on the contrary often greatly improved.

Reinhardt. The frequency of cholesteatoma of attic or antrum is so great that cure of the suppuration can only be effected by the Stacke operation. Further, the diagnosis of cholesteatoma before operation is often different.

ON THE INFLUENCE OF MALARIA ON DISEASES OF THE EAR.

Dr. Garzia had observed twenty-four cases. In the acute cases the febrile attacks came on with pain in the ear, which ceased with the lowering of the temperature, leaving the patient deaf during the period of apyrexia. Quinin in small doses, as a rule, exerts its usual specific influence. If any permanent deafness remains it is, in Garzia's opinion, to be invariably charged to the malaria.

THE USE OF THE CURETTE IN OPERATIONS ON THE MASTOID

The course usually pursued by Dr. Blake in an acute mastoiditis, with evidence of suppuration, is to make a small opening in the mastoid with the drill, enlarge with chisel, and immediately to use curettes of different sizes until all of the diseased tissue is removed and the cavity-wall made quite smooth; a free opening is made into the antrum; the cavity is then allowed to fill with blood, and after the formation of the clot the wound is douched with hot sterilized water, closed without sutures, and dry baked dressings applied. The operation on the mastoid is always preceded by a large incision of the drumhead. Complete healing in five days has been secured. The curettes are made with a long tip and a rounded bowl to avoid injury to the dura.

EXPLORATORY TYMPANOTOMY.

Dr. Blake. The drumhead is progressively sensitive from below upward. Incision opposite the round window causes in the majority of cases but little pain and permits the application of a sterilized solution of cocain to the cut edges, and a usually painless continuance of the incision. A flap is made which falls outward and exposes the insensitive region of the incus and stapes. Through this opening tenotomy of the tensor tympani or stapedius and division of adhesions may be done painlessly so long as the instrument does not touch the cut edges in the membrana tympani. After the operation the opening is closed by the application of a paper dressing moistened in sterilized water. Healing is so complete that the operation may be repeated at intervals, if it seems desirable, for repetition of mobilization of the stapes or for other operations.

EXTRACTION OF THE STAPES IN CHRONIC NON-SUPPURATIVE DISEASE OF THE MIDDLE EAR.

• Out of the twenty-two cases reported by Dr. Blake he was able in only one single instance to effect an improvement in hearing power and in this case fixation of the stapes was not complete. Some underwent decided deterioration as regards both hearing power and tinnitus. In five cases vertigo came on as the result of the operation, and in two of these it persists.

EXTRACTION OF THE STAPES.

Garnault, (Paris), performs the operation in (1) chronic hypertrophic otitis, (2) chronic purulent otitis after cure of the suppuration, (3) sclerosis. In this the subjective symptoms which seemed to indicate stapedectomy are notable diminution of hearing and tinnitus.

In the first two groups one may first try mobilization or rather perisynectomy of the stapes. One typical case of each class is reported. Results: In (1), hearing power diminished a little, tinnitus ultimately disappeared. (2), hearing power same as it was before the operation, tinnitus disappeared. (3), tinnitus diminished; hearing power not improved. Garnault cannot deduce definite indications for the operation, but would perform it in cases of very annoying tinnitus.

The discussion which followed related largely to mobilization of the stapes, and Gellé and De Rossi were emphatic in their opinion that it is only in the sequelæ of otitis media purulenta that favorable results may be expected.

A NEW SYMPTOM FOR THE DIAGNOSIS OF DEEP-SEATED AFFECTIONS OF THE MASTOID APOPHYSIS IN OTITIS MEDIA PURULENTA.

Wratsh, Nos. 48 and 49, 1893; *Rev. de Laryngol. d'Otolog., etc.*, Mai 15, 1894.

Dr. Okounneff urges the fact that there is often real difficulty in deciding as to the necessity for operation; that some of the symptoms ordinarily present, *e.g.*, pain and swelling in the mastoid region and upper posterior wall of the external meatus, may be absent; and that, on the other hand, all of the usual symptoms may be present and trepanation demonstrate the absence of pus. The more recently suggested percussion of the process has only a limited province. The procedure suggested by the author is based upon the conduction of sound through healthy and diseased bone,

and is as follows: An ordinary otoscope tube is taken, one end is introduced into the ear of the physician while the other is slipped over the end of a small-sized Politzer ear speculum which is applied to various points of the process to be examined. The physician strikes a tuning fork and places it on the vertex. If the bone is healthy a clear sound is conducted from the tuning fork through the tube: if on the contrary, the bone is diseased, the sound is dull. Two illustrative cases are detailed.

TREATMENT OF MASTOID SUPPURATION.

This subject was reported upon by Dr. Lubet-Barbon and Martin at the annual meeting of the French Society of Otology and Laryngology held in Paris, April 30, 1894. *Med. Week*, Paris, May 11, 1894. The following will serve to illustrate the practice of the French school of otologists. In an acute otitis, especially if severe mastoiditis threatens, the perforation in the drumhead is to be sufficiently enlarged and the pus evacuated by the frequent application of the air douche. It is to be used a great many times a day, and is much preferred to irrigation of the tympanic cavity through the Eustachian tube. The continued application of cold to the mastoid is recommended and blisters unconditionally condemned.

When the progress of the inflammation is not checked, trephining, without a preliminary Wilde's incision, is to be done without delay. The methods of Von Troeltsch (opening through the posterior-superior wall of the meatus): Carl Wolf, (removal with the chisel of the posterior wall of the canal after pushing forward the auricle and soft parts): Delaisement, (opening the cells near the tip and not including the antrum) are unfavorably considered, and the Schwartze operation recommended for acute cases. The incision is made in the retro-auricular groove and is sufficiently long to permit of turning the auricle and soft parts of the canal forwards and the posterior flap backwards. The opening with the hammer and chisel is made to the depth of 2.5 centimeters if required, in the angle formed by the temporal line which extends backwards from the spina supra meatum, and the posterior border of the meatus. When curetting the antrum and adjacent cells the cutting edge is not to be turned upwards or backwards on account of the sinus. The first dressing of iodoform gauze is, as a rule, left undisturbed for a week, and is carefully removed so that healing may not be interfered with.

In acute otitis it is unnecessary to proceed from the antrum to

the tympanic cavity, but with chronic trouble there the latter must likewise be opened. The method: After pushing the auricle forwards and downwards and detaching the posterior flap in its entirety, the soft parts of the canal are separated from the bone by means of a narrow raspatory, cut across as far in as possible and withdrawn like a glove finger. The antrum is then trephined and a probe introduced through the auditus into the tympanic cavity. The external bony wall is carefully chiselled away so that the tympanic cavity and antrum are connected by an open groove. The upper limit of this channel should barely pass beyond the temporal line while the lower must not be below the middle of the posterior border of the meatus in order that the facial nerve may be certainly avoided. The cavities are carefully cleansed and curetted, the cutaneous lining of the meatus, which was previously withdrawn, split along its upper border and the two flaps used to cover as far as possible the operation cavity. Gauze tampons are carefully applied through the meatus.

When a mastoid fistula exists the only proper course is to open the antrum and by removal of the bone to completely expose the track of the fistula; curetting in a blind way may result in the facial paralysis, opening of the sinus, or perforation of the cranium.

In the discussion Dr. Moure thought that Stacke's operation should not be performed for a simple otorrhea on account of the great loss of bone substance produced by it.

TREATMENT OF DEAF-MUTISM BY ACOUSTIC EXERCISES.

Discussion in Medical Society in Vienna. April 27, 1894, reported in Med. Week., Paris. May 4, 1894.

Dr. Urbantschitsch. The treatment consists in methodically exercising the organ of hearing. A beginning is made by pronouncing in the ear two vowels, *e. g.*, *a* and *e* in a loud voice until the child can distinguish them; then successively other vowels, the consonants, and sentences. Exercises of five to ten minutes, three or four times a week. Several persons should take part in the exercises to accustom the deaf-mute to different tones of voice. Musical notes are often used, and Urbantschitsch found that the perception of spoken words is thereby facilitated.

The results depend upon the degree of auditive perception and upon the extent to which this may be developed. This is largely influenced by the mental condition, and Urbantschitsch recommends that those who are backward should be separated from the normally endowed, in asylums.

Since October, 1893, sixty children were treated; of these none could distinguish sentences; six perceived words; twenty-two, vowels; thirty-two had only traces of audition left. In April, twelve perceived sentences; sixteen, words; eleven have only traces of audition.

Gruber favors these exercises but would not use them where only a trace of audition was found.

Politzer did not share Urbantschitsch's optimistic opinions. Spontaneous improvement is not rare when vowel perception exists. Further improvement obtained by acoustic exercises may be lost after a time.

INSTILLATION OF OIL IN CASES OF FOREIGN BODIES.

Ziem, (Dantzie), reports two cases in which instillations of oil apparently brought about spontaneous expulsion of the foreign body. In the first case attempts were first made with a hook to remove a pea from a child's ear. Dr. Zeim tried injections of water but unsuccessfully. Attempted perforation of the pea with the galvano-cautery was very painful, and instillations of warm oil were prescribed. The pea was, in a couple of days, so near the orifice of the ear that the mother removed it. In the other case a coffee bean was spontaneously expelled at the end of two days. After instillation a cotton tampon is to be inserted, and the patient directed to lie as much as possible on the affected side,

CHLORID OF ZINC IN OTITIS MEDIA PURULENTA WITH GRANULATIONS.

Montalescot, (Med. Week, Paris, June 1, 1894), cauterizes with a solution of chlorid of zinc, fifteen grains to the ounce. It is applied on absorbent cotton on a probe three or four times a week. Large granulations are first removed by the curette. The treatment is contra-indicated in otitis media purulenta in which the mucous membrane is simply hypertrophied.

ANOTHER MODIFICATION OF THE STACKE OPERATION

af Forselles, (*Archiv. für Ohrenheilk.* 36, 3 März, 1894), recommends a procedure first suggested by Schwartze to shorten the period of healing in the Stacke operation. In the case reported the preliminary operation was performed in the usual way. When the granulations in the tympanic cavity were being curetted some contractions in the muscles controlled by the facial nerve were

noticed, notwithstanding the fact that the Stacke "protector" (Schützer) was used. After trephining, the incision behind the ear was extended downwards 2 cm., and a flap 5 cm. long and 1.5 cm. broad, cut from the skin behind and below on the mastoid process and inserted in the wound cavity, an isthmus being left connecting the flap with the skin at the upper angle of the wound. The edges were then approximated and sutured. Five or six weeks later the field of operation was nearly altogether covered with epithelium. The author prefers this to the use of the Thiersch skin-grafts.

ABSTRACTS FROM ENGLISH AND AMERICAN CURRENT OTOLOGICAL LITERATURE.

BY LEONARD A. DESSAR, M. D.,
OF NEW YORK.

CHOLESTEATOMA OF THE EAR.

Dr. Harry Friedenwald, of Baltimore, (*Medical News, American Journal of the Medical Sciences*, May, 1894), gives a very interesting account of several cases of this disease: He says that it is important to remember that there is a tendency for cholesteatoma, or cholesteatomatous masses to recur. Patients are therefore to be examined at intervals of a few months for a long time after their apparent cure.

The treatment consists chiefly in the thorough removal of the cholesteatomatous masses, and complete antiseptic cleansing of the drum cavity by the ordinary well-known means.

SIMPLE INFLAMMATION OF THE MIDDLE EAR, AND SEQUELÆ.

At the recent meeting of the Pennsylvania Medical Society, Dr. S. MacCuen Smith, of Philadelphia, (*Medical News*, May, 1894), read an interesting paper on this subject.

He stated that in all cases the ear of the new born child should be examined, and if no accumulation in the external auditory meatus be found, and the membrane seems to be inflamed to any

extent, the middle ear should be inflated according to Politzer's method. There are two forms of acute inflammation of the middle ear: one is due to exposure to cold, wet, etc., and the other is due to the entrance of some infectious agent. Whatever the cause of the inflammation, the inflammatory exudate will undergo fatty degeneration unless removed. Inflation of the ear is the most important element of treatment in most cases. Deaf-mutism must be regarded as a sequela of some pre-existing inflammatory disease.

EAR COTTON—SALMON COLORED.

Dr. George E. Abbot, of New York, (*Medical Record*, June 23, 1894), recommends in place of ordinary white cotton, the use of salmon colored absorbent cotton, which has the advantage of being so nearly the color of the auricle, that it is difficult to perceive it in the ear.

CHRONIC TYMPANIC VERTIGO; ITS RELIEF BY SURGICAL LIBERATION OF THE STAPES.

Dr. Charles H. Burnett, (*Medical Age*, June 11, 1894), in an article read before the American Otological Society, May 29, 1894, discusses the affection for which he has suggested the name of chronic tympanic vertigo. In this condition there is an abnormal retraction in the conductors of sound, and the stapes, being the weakest, is forced unduly into the oval window: excessive pressure is thus exercised, the labyrinth fluid, the motor filaments of the auditory nerve are irritated, and vertigo is the result. Chronic tympanic vertigo usually occurs in an ear which has been for some time previous the seat of tinnitus and deafness from a chronic catarrhal process in the drum cavity. The nares and naso-pharynx usually show by this time no disease. The membrana tympani will be found markedly and continuously retracted, and the stapes therefore unduly pressed into the oval window and held there by the overpowering weight and force of the malleus and incus.

A characteristic feature of chronic tympanic vertigo is its paroxysmal occurrence, which distinguishes it from the vertigo caused by a tumor in or near the auditory nerve, which is always constant though it may be slight. Retention of consciousness even in the worst cases, where the patients reel and fall, serves to distinguish tympanic vertigo from epilepsy and apoplexy, though it is unfortunately too often mistaken for these maladies.

The only way to relieve chronic tympanic vertigo and the tinni-

tus and deafness always attending it, is to liberate the stapes. This is best accomplished by elimination of the incus from the retracted chain of ossicles. Thus the power of the retractive lever is overcome; and the stapedius, relieved of its forceful antagonist, the tensor tympani, lends assistance in drawing the stapes from the oval window, and the morbidly impacted bone is liberated.

The author reports three cases of tympanic vertigo relieved by removal of the incus, in addition to sixteen similar ones previously published, all of which testify to the utility of this operation.

MIDDLE EAR OPERATIONS FOR IMPROVING THE HEARING.

Dr. E. B. Dench, (*Medical Record*, June 9, 1894), concludes that the removal of the stapes, both in the suppurative and non-suppurative cases, had not yielded as uniformly good results as removal of the two larger ossicles and artificial mobilization of the stapes. In all, sixty-three cases had been operated upon for improvement of the hearing, and in fifty-five the results had been satisfactory.

STACKE'S RADICAL OPERATION FOR OBSTINATE CHRONIC OTORRHEA.

Dr. Walther Vulpius, (*Medical Record*, June 16, 1894), gives an elaborate description of this operation, and reports cases which demonstrate that it will cure even the most obstinate and the most strangely complicated chronic otorrheas. In the author's opinion the Stacke operation is indicated as the final and most radical means of treatment in cases of chronic middle ear suppuration, which is maintained either by cholesteatoma of the attic and antrum or by caries, if the latter cannot be with certainty be confined to the ossicles. It should not, however, be resorted to before more sparing methods have been thoroughly tried, and proved to fail.

Only if threatening complications or abscesses over the mastoid region immediately require an opening of the antrum, it is, in most chronic cases of middle ear suppuration, advisable to make at once the more radical Stacke operation, which shortens the time of after treatment, and gives better chance for a permanent cure of the otorrhea.

The operation should never be made in cases of mastoiditis complicating an acute otitis media purulenta.

BELL'S PARALYSIS FOLLOWING EAR OPERATIONS.

Dr. L. J. Hammond, (*Medical News*, May 26, 1894), reports three cases of upper tympanic or attic suppuration, in which operation was followed by facial paralysis; he believes, that owing to the anatomy of the parts this accident is very likely to occur.

This region of the middle ear is marked off at about its middle by the bony ridge which forms the covering of the facial nerve, or, the nerve may pass through this region entirely devoid of any bony covering. Nothing but the greatest care could possibly prevent wounding this important structure, if the bony covering be present and carious, its removal cannot be accomplished without seriously interfering with the nerve.

The operation employed by the author, comprised removal of the bones of the ear, and chiselling away of the upper posterior portion of the roof of the canal. He propounds the question whether this condition is less likely to occur after Stacke's operation.

A CASE OF ACUTE INFLAMMATION OF THE MIDDLE EAR, TERMINATING IN PURULENT PERIPHEBITIS OF THE LATERAL SINUS.

Dr. Albert H. Buck, (*Medical Record*, June 30, 1894), in a paper read before the American Otological Society, reports a case of this affection, which is of a special interest because it began almost at the start as an Osteitis. Paracentesis of the drum-membrane was performed at an early period—*i. e.* at the end of 24 hours, for the relief of the intra-tympanic pressure, but failed to arrest the progress of the inflammation. The author explains his lack of success on the ground that even at this early stage, the inflammation of the adjacent bone, particularly that portion which lies near the posterior end of the tympanum, and around the antrum had made considerable headway. About one month after the first observation, the mastoid was trephined, but no pus encountered until the antrum was reached, and then only a small amount. The pain was relieved by the operation, but recurred later, and as there was an increase in the redness and swelling of the integuments covering the lower and posterior part of the mastoid process, this portion was removed by chiselling. No pus however was found, but the bone appeared in a markedly hyperemic condition. The symptoms became worse after the last operation; the movements of the head became more painful, and there was an increase of the swelling and tenderness in the region

of the mastoid bone and occiput, and pain in the left eye. These symptoms led the author to believe that the inflammation was extending in a backward and inward direction, and for that reason he chiselled away the outer and posterior surface of the mastoid, no pus being found until the immediate wall of the channel for the lateral sinus was reached. At this point the bone seemed to have undergone softening, and thrombosis of the vein appeared to be present. In view of this serious condition of affairs the author availed himself of the services of Dr. Theodore Lange, who exposed thoroughly the downward track of the pus along the jugular vein. He also removed all that remained of the mastoid process, thus laying bare the jugular vein from its situation in the sigmoid groove, down to a point about one inch below the level of the mastoid process. All of the juglar vein thus exposed to view was evidently in a thrombosed condition, as its wall showed no changes in tension when firm pressure was made upon the side of the neck, lower down, or when the patient coughed. Dr. Lange, also removed, in an upward direction, enough of the squamous portion of the temporal bone, where it forms the outer wall of the vertical part of the lateral sinus, to give him free access to any collection of pus that might exist in this part of the cranial cavity. No such collection, however, was found. Then, finally, he worked his way cautiously downward and inward until he had exposed the styloid process, the trunk of the facial nerve as it emerges from the stylo-mastoid foramen, and the region beneath the foramen lacerum. The probe was passed through this opening into the cranial cavity, but no collection of pus was found. Since this operation, the patient has been progressing rapidly toward recovery. It is noteworthy that throughout the entire attack, the hearing in the affected ear remained fairly good, and has now returned to a normal condition. On the ground of the present case, and others of a more or less similar nature recorded in medical literature, Dr. Buck formulates the following rule. "The persistence of deep seated pain behind the mastoid process, continuing after the antrum has been opened and thoroughly drained, is sufficient warrant for making an opening into the sigmoid groove for the lateral sinus; and it is not advisable to wait until the patient has chills, or until the body temperature has risen to an appreciable degree, before resorting to operative interference in this direction." If we wait for the corroborative evidence furnished by the symptoms last named, we shall lose lives that might otherwise be saved.

RHINOLOGY AND LARYNGOLOGY.

ABSTRACTS FROM CURRENT LARYNGOLOGICAL
AND RHINOLOGICAL LITERATURE.BY M. D. LEDERMAN, M. D.
OF NEW YORK.

EPITHELIOMA OF THE SEPTUM.

Dr. MacIntyre, (*Jour. of L., R. et O.*, Vol. 8, No. 6). The patient, a man aged 53, thought he was suffering from polypus. On examination the tumor was observed springing from the anterior portion of the septum and involving the perichondrium over the triangular cartilage on the left side. The growth, together with the cartilage, was excised. Microscopical examination showed it to be epithelioma.

ANGIO-FIBROMA OF THE TONSIL,

Mr. Wyatt Wingrave, (*Ibid*). This specimen, diagnosed by the microscope, was shown before the British Laryngological and Rhinological Association at the April meeting. It first appeared as a red polypus projecting about half an inch from the surface of the left tonsil.

ACTINOMYCOSIS OF THE FACE CURED BY IODID
OF POTASSIUM.

Dr. Gaube. (*Ibid*). The disease appeared in a girl 18 years old. It resembled dental periostitis, (tumefaction of the left maxillary and gingival regions). Carious teeth and fungous gingivitis existed. Over the tumor the skin was blue-violet in color, and there was engorgement of the sub-maxillary glands. Incision into the swelling was followed by an outflow of a small quantity of liquid containing yellow grains. The microscope, together with bacteriological investigation of these bodies, revealed the nature of the affection. The patient declined operative interference, so iodid of potassium was prescribed—three grains daily. Two weeks later suppuration occurred in the tumor, and a small abscess opened with discharge of pus and yellow patches of actinomyces. Complete cure followed in two months.

EXUDATIVE PHARYNGITIS.

Dr. Glasgow, St. Louis. (*Medical News*, Vol. 64, No. 24).

A paper upon this subject was read at the annual meeting of the American Laryngological Association, June 1, 1894. The case reported was that of a child ten months old, following exposure to cold. Pain in the ear, with coryza and high fever were the symptoms present from the outset. The temperature was very irregular, resembling that of a septic process. Excoriations around the nose were covered with a whitish pellicle. Similar lesions appeared on the tonsils, uvula, soft palate and pharynx, but not in the nose. There were no enlarged glands. The disease was treated with sodium salicylate and phenol, with brandy internally and hydrogen peroxide externally. Prolonged aphonia and urgent dyspnea were prominent symptoms. The mucus contained streptococi, but no Loeffler bacilli.

SINGERS' NODES.

Dr. F. I. Knight, Boston, (*Ibid*). The author describes these lesions as little nodules on one or both vocal chords at or about the junction of the middle and anterior thyroids. They are caused by overstrain of the voice or faulty use of same. When of the diffuse variety, they are known as chorditis tuberosa of the bands. Rest and mild astringents have proven satisfactory treatment in the author's experience. Gleitsmann recommends the galvano-cautery, chromic or trichloracetic acid. The solid stick of argentum, lactic acid in concentrated solutions have also proven beneficial.

A CASE OF LUPUS OF THE NOSE AND LARYNX.

Dr. Dundas Grant, London, (*British Med. Jour.*, No. 1744). The patient was shown before the Laryngological Society of London. The treatment was scraping, with the application of lactic acid and arsenic internally. Dr. Lemon showed a girl 10 years old suffering from lupus of the gums, roof of the mouth, posterior palatine arches, epiglottis and the ventricular bands. At different places cicatricial tissue was observed. The same line of treatment was to be used, together with the galvano-cautery, and cod liver oil internally.

EPISTAXIS.

Dr. Robert Fullerton, Glasgow, (*Glasgow Med. Jour.*, Vol. 40, No. 5). In the author's experience the bleeding point was quite

frequently found on the anterior surface of the cartilagenous septum, about half an inch behind the columna, and half an inch above the floor of the nostril. For slight erosions nitrate of silver or chromic acid have proven satisfactory. The galvano-cautery has acted perfectly in every case. Iodoform gauze is excellent for plugging.

ANTIPYRIN AS AN ANESTHETIC IN DISEASES OF THE NOSE, PHARYNX AND LARYNX.

W. Urobleioski, (*Archiv für Laryng. und Rhinologie*, Vol. I, No. 3). The author, after numerous trials, finds antipyrin used as a parenchymatous or submucoid injection, a most excellent anesthetic. He has removed portions of deflected septums, curetted tubercular larynges, galvano-cantherized granular pharynges without giving any pain to his patients. In tubercular laryngitis with extreme dysphagia, an injection of the antipyrin solution, in the neighborhood of the arytenoid cartilages, has given freedom from pain for twelve hours. In a number of cases the pain has been absent for a similar length of time, *i. e.*, twelve hours. In these cases he employs a 50 per cent solution, injected by means of Heryng's syringe. The drug acts better in combination with cocain, the author preferring the following solution:

Antipyrin,	2.0
Cocain muriate,	1.0
Aqua dest.,	10.0

Although the injections were made frequently, he has never had any complications arising. The local anesthesia is at its height from fifteen to thirty minutes after the injection.

THE PHARYNGO-LARYNGEAL TYPE OF ACUTE MILIARY TUBERCULOSIS.

Dr. George Catti, Fiume, (*Wiener Klinische Wochenschrift*, Vol. 7, No. 24). This rare manifestation was observed in two children. In the first instance, a boy 8 years of age complained of sore throat and dyspnea. Examination of the pharynx revealed nothing abnormal, but the laryngeal picture showed marked edema of the glottis and lig. pharynges-epiglottica. The condition strongly resembled an acute edema, except here and there small ecchymotic spots were noticed. Two days later the miliary tubercles appeared distinctly. No autopsy was performed in this case.

The other patient was a girl 12 years old, was brought to the clinic suffering from pain in attempting to swallow. Nothing but fluids could be swallowed. On examination the cervical glands were found swollen, with a marked redness and edema of the uvula, the gums and both tonsils. The appearance of the throat was that of a starting diphtheria, but no elevation of temperature was present. The girl absented herself for a few days, but returned with marked dyspnea and a diagnosis of diphtheria. A croupous membrane had formed over the tissues, but miliary tubercles could be seen on the small of the pharynx, epiglottis, the arytenoid cartilages and ary-epiglottidean folds. The glottic-chink was almost entirely obliterated by edema of the soft tissues. After a few days of increasing dyspnea, the child succumbed. The necropsy corroborated the diagnosis of acute miliary tuberculosis.

Dr. W. H. Wakefield has removed from Salem, N. C., to Winston, N. C.

Dr. G. Oram Ring, of Philadelphia, has removed to 1442 North Thirteenth Street.

Dr. J. E. Sheppard, of Brooklyn, N. Y., has removed from 175 to 147 Remsen Street.

Dr. Dunbar Roy, Atlanta, Ga., has removed from Whitehall street to "The Grand."

Dr. Oren Oneal, of Wabash, Indiana, has moved into the new Masonic Temple of that city.

Dr. W. H. Baldinger, Galveston, Texas, has removed his office to 406 Twenty-first Street.

Dr. Clarence Archibald Veasey, of Philadelphia, was married to Miss Gertrude Mabel Clogg, of the same city, on the 20th of June, 1894.

Dr. B. A. Gemmell, who has been in practice at Pendleton, Oregon, a number of years, has returned to Salt Lake City, and resumed practice.

Drs. A. C. Rogers and Thos. J. McCoy, late House Surgeon to the Manhattan Eye and Ear Hospital of New York, have entered into a partnership at Los Angeles, Cal. Dr. Rogers has been established in practice at Los Angeles a number of years. He is also an Ex-house Surgeon to Manhattan Eye and Ear Hospital.

Dr. Harlan P. Allen, of Columbus, Ohio, favored the ANNALS with a copy of the law passed by the Ohio Legislature last spring, for the prevention of blindness, which should have appeared in the April issue of the ANNALS, but was crowded out. The law is the same as the form that was drafted by the committee appointed by the Ophthalmological Section of the American Medical Association, last year, which has become a law in New York, Maine, Rhode Island, Minnesota and Maryland.

FOR SALE.—One of Nacet's Complete Cases of Trial Lenses, mounted in silvered and gilt rims. In plush morocco case. Never been used; good as new. Price \$75.00. Address, Dr. B., Care Dr. James P. Parker, 501 Union Trust Building, Saint Louis, Mo.

STANDARD DICTIONARY OF THE ENGLISH LANGUAGE UPON ORIGINAL PLANS, DESIGNED TO GIVE, IN COMPLETE AND ACCURATE STATEMENT, IN THE LIGHT OF THE MOST RECENT ADVANCES IN KNOWLEDGE AND IN THE READIEST FORM FOR POPULAR USE, THE ORTHOGRAPHY, PRONUNCIATION, MEANING AND ETYMOLOGY OF ALL THE WORDS AND THE MEANING OF IDIOMATIC PHRASES IN THE SPEECH AND LITERATURE OF THE ENGLISH SPEAKING PEOPLES. BY FUNK & WAGNALLS COMPANY, NEW YORK.

When I bought Webster's International Dictionary I thought it was perfect, but when I examined The Century I thought of the man who said he could make perfect thermometers, but refused business when the Doctor ordered *two perfect* thermometers.

I now have Webster's International, The Century, and the first volume of The Standard. When asked which is the best I say, *all of them*. They form the tripod of the English language. Each has its peculiar merits. The student should have them all, but if he can have one, only, let it be The Standard, because it is the most recent and up to date, and has many distinctions heretofore overlooked, or inadequately presented which add excellence to the text, and will be appreciated by those who are choice in the use of words. The Standard has given special attention to synonyms, and has added the antonyms to its list.

The Standard has made a new departure in selecting quotations from recent authors and indicating where they can be found.

It is stated that 100,000 volumes have been consulted in order to obtain these quotations, and that 500 readers have been engaged in hunting them up for the dictionary. A conservative drift toward the simpler form of spelling has been recognized throughout the work, and the diphthongs "æ" "œ" have been exchanged for the letter "e" in all words fully Anglicized. Vocabulary places have been given to the 3,500 words to which the American Philological Association and the American Spelling Reform Association recommend the immediate application of the principles of the spelling reform, the same principles that have been adopted also by the Philological Society of England.

The dropping of the "e" in the spelling of words in chemistry, *e. g.*, bromin, morphin, quinin, iodin, chlorin, iodid, atropin, etc., in compliance with the wishes of the Chemical Section of the American Association for the advancement of Science, is a long step forward. Those who use a dictionary, like the working physician, will find the two volumes into which The Standard is divided of great convenience, though we are told that the entire work can be obtained in one volume. The Standard Dictionary is full, accurate and complete.

Each set of words has been treated by an expert in the science, art, craft, etc., to which the terms belong. The pictorial illustrations are original, numerous and admirable. In typography, arrangement of matter, quality of paper and binding, the book is all that could be desired.

AN ILLUSTRATED DICTIONARY OF MEDICINE, BIOLOGY AND ALLIED SCIENCES: INCLUDING THE PRONUNCIATION, ACCENTUATION, DERIVATION AND DEFINITION OF THE TERMS, USED IN MEDICINE, ANATOMY, SURGERY, OBSTETRICS, ETC., ETC. By George M. Gould. A. M., M. D., Author of "The Student's Medical Dictionary;" "12,000 Medical Words Pronounced and Defined;" "The Meaning and the Method of Life;" Editor of "The Medical News;" President 1893-1894, American Academy of Medicine; one of the Ophthalmologists of the Philadelphia Hospital. Small quarto. pp. 1,633. P. Blakiston, Son and Co., Philadelphia, 1894.

As indicated upon the title page, the work in this volume is "based upon recent scientific literature;" hence its value to the physician of to-day. To effect this purpose, the author has spent much labor and time. First, he has been compelled to look over innumerable monographs and volumes upon special subjects, and to search through that great maze of literature, which comes to us periodically, in order to find new words and their significations. From this great world of medical writings, he has found it necessary to separate and to use those words that have any legitimate value both as to correctness of coinage and truthfulness of intended meaning. Besides doing this, he has included all those obsolescent terms that may be of use to the present student.

Recognizing the desirability of knowledge of biologic terms and those of other related sciences to the medical man of to-day, he has taken great pains to place all those words and meanings in botany, zoölogy, pharmacy, chemistry, etc., that may be thrown into the path of the reader of medical subjects. To this, giving as much as possible an encyclopedic character to the work; adding graphic illustration where verbal expression would be vague; classifying great numbers of words and expressions of relevant meaning into well ordered and carefully arranged tables, (an attempt that has not been before equalled in the English language); adopting the newest and the best grounded suggestions for consistent phonetic spelling, such as has been adopted by the most prominent, and in fact world renowned general lexicographers of to-day; and offering the easiest and the most comprehensible plan of orthoepy by noting the sound of the vowel by its relative position in the word, and thus eschewing as many diacritic marks as possible, he obtains one of the greatest results and one of the most successful undertakings in modern medical lexicography.

For the benefit of the usual readers of this journal, the reviewer, who is fairly conversant with their philologic needs in Ophthalmology, has spent much time in scanning through the book, in order to determine the correctness of derivation, the certainty of the method of pronunciation, and the exact signification of the most used and the most doubtful words in this branch of medicine. He has so universally found his expectations realized, that for these

reasons alone, he would recommend the volume as one of the best of friends and one of the safest of helpers to every ophthalmic student, who in his literary undertakings, desires to keep abreast with these progressive times.

MISCELLANEOUS.

According to the Eleventh Census of the United States (Part 2 of the Compendium, not completed) Missouri has more blind people than any other State, according to population, as will be seen by observing the following statistics, which were kindly furnished to the Editor of the ANNALS by the Commissioner of Census:

STATE.	Population Males.	Population Females.	Total Population.	Blind Males.	Blind Females.	Total Blind.
Massachusetts	1,087,709	1,151,234	2,238,943	978	868	1,846
Missouri	1,385,238	1,293,946	2,679,184	1,331	1,126	2,457
Illinois	1,972,308	1,854,043	3,826,351	1,649	1,185	2,834
Pennsylvania ..	2,666,331	2,591,683	5,258,014	2,262	1,663	3,925
New York	2,976,893	3,020,960	5,997,853	2,370	2,019	4,389

It is to be observed that Missouri has 91.60 blind people per 100,000 inhabitants, while Illinois (next door neighbor) has only 73. blind people per 100,000 inhabitants. Illinois has a State Eye Infirmary (Hospital, organized May 1858) for the gratuitous treatment of the poor, afflicted with disease of the eye, and while the population of Illinois has continued to increase, the well trained ophthalmologists, with the advantages of the State Infirmary, have reduced blindness and thereby enabled hundreds of poor men, whose eye-sight was almost gone, to return to honest labor and earn their own livelihood, and become good and useful citizens, instead of being expensive wards to the State. Missouri is now only thirty-six years, three months and five days behind Illinois, in things medical, and may never have as many people, with good eyes, but Missouri will soon have more blind people to support than Illinois can ever have, if the Missouri Legislature does not provide a suitable hospital and the necessary appliances for the proper treatment of the poor who are afflicted with disease of the eye.

The corporation doctor appears to be in line of promotion. He may eclipse the medical college professor in the Western States, within a few years. His practice has heretofore been "limited to railroad surgery," whatever that may mean, but the managers of the big dry goods corporations are sometimes railroad directors and know about the railroad surgeon, and we are told that the dry goods corporations are preparing to establish and maintain prescription counters and employ "leading physicians" to prescribe for customers free(ly) and do minor operations—*e. g.*, "remove ovaries while you wait, repair perineums (for ladies) without delays, and cauterize chancre (for the boys) while the band plays." The condition of the married men who pay dry goods bills will be no better than that of the honest family physician—"general practitioner." The manager of one dry goods corporation has been advised to employ tall M. D.'s so they can take packages from high shelves for the salesladies, when not professionally engaged.

It has been remarked that the present superintendent of the Saint Louis, (Mo.) City Hospital would make a good newspaper advertising agent, and the dry goods corporations would do well to get him, after his term expires, and a good physician, who is not "supported" by the diploma mills, is appointed to conduct the legitimate medical affairs of the City Hospital (not to advertise himself in the newspapers).

If it has come to pass that the office of superintendent of the Saint Louis, (Mo.) City Hospital can not be held by a physician, without making it an advertising scheme, and thereby violating the correct established principles of the honorable profession of medicine, the office should be relegated to the fake "political doctor."

The number of good contributions offered to the ANNALS continues to increase so that it has become absolutely necessary that the book be again enlarged. This number contains sixteen pages more matter than the April number contained, and the next, October, number will contain more than one hundred and forty-four pages. Arrangements are being made to send the ANNALS out in beautiful book form next year. Each number will contain one hundred and sixty pages.

TO CONTRIBUTORS.

COMMUNICATIONS *are invited from all parts of the world.*

Authors who propose to favor the ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY with contributions are requested to observe the following:—

1. In accepting an article for publication under the head of "ORIGINAL COMMUNICATIONS," it is done with the understanding that it is to be contributed to the ANNALS *exclusively*, and that copies or abstracts of the same have *not* been and will *not* be published in any other journal.
2. Writing must be distinct and plain, and *especially all proper names.* (*If possible a manuscript should be type-written.*)
3. Proofs will be furnished authors for correction and revision, but it is requested that alterations be limited to what is of essential importance, as changes in the copy are equivalent to resetting, and cause additional expense and much annoyance.
4. The ANNALS especially desires brief, mature, concise articles on practical subjects, as its readers are busy physicians who desire results, therefore the author who condenses expression enhances the value of his contribution and is rewarded by having it extensively read.
5. Authors will be furnished with reprints of their articles, in pamphlet form, handsomely printed on the finest quality of paper, at cost. (See next page.)

The ANNALS is published four times a year: On or about the last of JANUARY, APRIL, JULY and OCTOBER, and all ORIGINAL ARTICLES for succeeding issues should be ready to place in the hands of the printer about sixty days before date of publication.

The number of good original papers offered to the ANNALS continues to increase, so that we cannot engage to publish an article in any specified issue.

When two or more original articles upon the same subject are received, the shortest, most pithy and concise will take precedence.

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ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY.

OCTOBER, 1894.

PARESIS AND PARALYSIS OF THE EXTERNAL RECTUS MUSCLE OF THE EYE— REPORT OF TWO CASES.

BY DUNBAR ROY, A. B., M. D.,
OF ATLANTA, GA.

PROFESSOR OF OPHTHALMOLOGY AND OTOTOLOGY IN SOUTHERN MEDICAL
COLLEGE.

VERY little has been added to the subject of ocular paralysis since the publication of Mauthner's valuable treatise upon that pathologic condition. Clinical cases and a few minor suggestions as to classification are occasionally seen in the medical literature, but so far the monograph of that distinguished Viennese teacher is more universally accepted in its teaching than any other work on the same subject. Among the diseases of the eye some form of ocular paralysis or paresis is by no means uncommon, and of this pathologic condition the majority of writers¹ consider that of the external rectus muscle the most common. Two cases occurring in my private practice, one of paresis and the other of total paralysis of the external rectus muscle of one eye, presented several points of interest to which I wish to call attention in this article at the conclusion of a detailed account of the histories of the same.

Case I. Paresis of the left external rectus due to malarial infection.

F. S., male, 42 years of age, electrician, presented himself at my office with the following history: For the last three weeks there has been a feeling of giddiness and discomfort about the head whenever he turned his eyes to the left; has been a resident of this city for the last two or three years, before which time having lived in several of the Northern and Western cities, engaged in the electrical business; has enjoyed good health up to six months ago, but since then he has suffered occasionally with a general feeling of malaise and discomfort. During the last month he was

¹ Fuchs, Swanzy, de Schweinitz, Norris and Oliver, et al.

treated by his family physician for several attacks of "biliousness;" is continually tired; has never had any specific trouble, and on that point the history is very clear; he complains that for the last few weeks there has been a contusion of objects when looking up and to his left, at such a moment everything seems blurred; that sensation is not produced when looking to the right; it causes him so much inconvenience as to be scarcely able to work. The patient's complexion is very sallow, otherwise he looks strong and healthy. The urine was examined and showed nothing abnormal. Examination of the eyes: O. D. V. = $\frac{5}{6}$, no Hm.; O. S. V. = $\frac{5}{6}$, no Hm. Reads Jaeger No. 1 easily with either eye. Javal's was negative as also retinoscopy. By the ophthalmoscope the mediæ are seen to be perfectly clear; slight haze around the periphery of both discs; venous pulsation; in the left eye there was an extra arterial branch running down from the central perforating trunk. Muscular—By simple ocular inspection both eyes appeared normal when fixed upon an object directly in front. When the object was moved to the right (patient's) there was still no deviation. When moved to the left (patient's) the left eye was tardy in its movement in that direction, and towards the extreme temporal periphery refused to move at all. When an object was held directly in front of both eyes at a distance one-half meter there was no diplopia, but as soon as it was carried toward the left, diplopia was immediately produced, the objects becoming further separated the further to the left the object was moved. With the red glass and candle flame at 6 meters there was found to be homonymous diplopia with a space of about 10 inches, increased, however, the further the head was turned to the right. The diplopia was corrected by a prism of 4 base out over either eye, but only when both eyes are parallelly directed in front of the body. Pupils normal in size and reacting to both light and accommodation. A diagnosis of paresis of the left external rectus muscle was made, the cause of which could not then be ascertained. There was no history of trauma, no signs of a syphilitic taint, no history of rheumatism, recent cold or anything with which the symptoms could be linked.

Treatment—The patient was placed upon sulph. strychnin $\frac{1}{60}$ gr. three times daily, with a gradual increase of the dose, using also the daily applications of electricity, alternating the constant with the induced current. This was continued for two weeks, when the tests showed not the slightest improvement, but in fact the images were a little further apart. The treatment was now changed by substituting the iodid of potassium for the strychnin, 20 gr. three times daily, with a continuance of the electrical applications. This was continued for two weeks, and still there was no appreciable sign of improvement. About this time the patient complained of having chills or chilly sensations every other night, and for the first time I noticed a distinct malarial cachexia. He was immediately placed upon active anti-malarial treatment, with the satisfaction of seeing a marked improvement within a few days. This treatment, with the addition later of tonics, was continued for some time, and on May 1, after an absence of about one week, the patient reported that he felt as well as ever and that there was absolutely no confused feeling as formerly when turning his eyes to the left. On testing the eyes the left was found to move as freely as the right in all directions. There was no diplopia discoverable at any angle,

either far, near or distant objects. Patient's general health much improved. In the light of the above I feel fully justified in attributing the cause of the paresis to malarial infection involving some portion of the sixth nerve.

Another case, while of not so much interest as that of the other in so far as the etiology is concerned, is, nevertheless, interesting in the result obtained and the method of treatment used.

Case II. C. T., 7 years of age, male, was brought to my office in January, 1891, by his father to see what was the cause of the double vision of which his boy complained. He gave the following history: The boy is perfectly strong and healthy. On the day before he attended school and remembered that in dropping something by his desk he stooped to pick it up when his left temple struck the edge of the desk. When he left school that afternoon for the first time he noticed that he saw double. The next day his father brought him to my office. Examination showed complete paralysis of the left external rectus muscle. There was no sign of a contusion about the orbit nor was there any ecchymosis discoverable about the eyeball itself. The lad was strong and healthy looking and showed in no wise any blood or lymphatic dyscrasia. There was no discoverable lesion in the bones about the orbit. Am unable to say whether it was the muscle or nerve proper which was affected, probably the former, due to a small hemorrhagic focus somewhere in its course, as the result obtained in the treatment in a great measure demonstrated.

Treatment—The patient was placed upon the sulph. strychnin $\frac{1}{60}$ gr. twice daily, gradually increasing the amount and at the same time alternating it with the iodid of potassium. In addition to the above there was the daily applications of electricity. Under this regime at the end of a month no appreciable change for the better being discernable, I commenced the gymnastic exercise of the paralyzed muscle. At first daily, after the application of electricity, the eye was cocainized and with a pair of fixation forceps the conjunctiva was seized over the affected muscle, the globe turned first to the right and then to the left, the patient being instructed at the same time to turn the other eye in the same direction, so that there might be associated movements of the two eyes. After three treatments the eye began to move a little to the left. Steady improvement now continued, so that frequency of the treatments being gradually lessened, about the 1st of April, three months afterwards, the patient's eyes had reached their normal equilibrium.

Cases of paralysis of the external muscles of the eye are by no means uncommon in ophthalmic practice, and the only reason for presenting the cases above is that in Case I the cause was referable to malarial intoxication and in Case II because of the excellent and speedy result obtained by the gymnastic method of treatment. Of the individual paralysis all writers agree that that of the external recti is the most common, as would naturally be expected from an anatomical point of view. In the literature at my command I have been unable to find any cases of paralysis of the

external ocular muscles where the cause was attributed to malarial infection. One writer², however, in a recent text-book, says, "paralysis of one or more of the external muscles of the eyes may also be due to malarial poisoning," not stating whether he has seen such cases. A very thoughtful resume as to the etiology and prognosis of paralysis of the ocular muscles is given by Liebreich³. In 25,000 patients treated between 1885 and 1890 there were 312 cases of paralysis of the muscles, not including uncomplicated paralysis of accommodation after diphtheria. Of these 312 cases 90, or 29%, were caused by tabes: 43, or 4%, by brain syphilis, and 114, or 36%, from unassigned causes. The remaining 65 cases, or 21%, were from a number of causes, as paralysis general, diphtheria, meningitis, influenza, rheumatism and other diseases. Thus in 64% the etiology was established, and in 36% it was not. The same author believes that every case of apparently idiopathic paralysis of the ocular muscles has its cause in a diseased condition of the body, which may not be detected for years subsequently. From this table of causes we see no mention of malarial infection, unless it be included under the head of general diseases.

That malaria is a cause, however, of many diseases of the eye has been known for a long time to ophthalmologists, and yearly the clinical cases of such are increasing.

Sulzer⁴ finds the following categories of visual disturbances:

1. Chronic optic neuritis in grave cases associated with melanosis of the optic disc.
2. Diffuse infiltration of the vitreous body.
3. Numerous small hemorrhages in peripheral portions of the retina.
4. Sudden incurable amaurosis, probably in consequence of central hemorrhages or emboli.

De Schweinitz⁵, from his own experience and from a careful study of the literature, concludes that malaria may originate:

1. An ophthalmia of the intermittent type which sometimes replaces the ordinary manifestations of the disease.
2. A certain form of keratitis.
3. Various functional ocular troubles—amblyopia, paresis of accommodation, changes in the field of vision, even hemianopsia and night blindness.
4. Gross changes in the interior of the eye—optic neuritis, optic atrophy, retinal hemorrhages and hemorrhages in the vitreous.

McNamara⁶ has reported two cases of malarial neuritis and neuro-retinitis.

² Adolph Alt, *Text-Book of Ophthalmology*, 1893.

³ Liebreich, *Münch. Med. Wochenschrift*, June, 1890.

⁴ *Klin. Monatsblätter f. Aug.*, July, 1890.

⁵ *Medical News*, June, 1890.

⁶ *British Medical Journal*, November, 1890.

Bazot⁷ reported two cases of double soft cataract and one of atrophy of the optic nerve following pernicious malaria in adolescents.

Risley⁸ recorded a case of multiple retinal hemorrhages, recurring periodically, due to malarial poisoning.

Here, in the South, many diseases of the eye can be traced to malarial infection, and for the successful treatment of ocular troubles this fact must be borne in mind by Southern ophthalmologists. This statement applies more especially to those districts whose environments aid in the propagation of this miasm, or to such persons as have moved South from a cooler atmosphere. Here in our own city the altitude is so great and we are so entirely cut off from any low and marshy districts that true malaria is extremely rare, the majority of such cases being exotic in their origin. I am fully convinced, however, from close observation and clinical experience that in the South there are certain peculiar types of ocular troubles which are not found in the Northern clinics, and some day I hope to embody these observations into a more tangible form.

Case II is interesting both in its etiology and the success obtained by the gymnastic method of treatment. Traumatism is one of the most universal causes mentioned by writers upon this subject of isolated ocular paralysis.

Gutierrez-Ponce⁹ has reported a case of paralysis of the right externus noticed the day following a fall upon the occiput in a boy affected with chronic otitis of the right side. Iodid of potassium and stimulating friction having aggravated the condition, local treatment addressed to the ear was begun, with immediate improvement. Two four-minute seances with a galvanic current of eight couples from brow to closed lid completed the cure.

Feilchenfield¹⁰ has reported another case of paralysis of the left abducens caused by a contusion of the occiput. He thought the probable cause was a circumscribed central hemorrhage. He cured his patient by the use of iodid of potassium and electricity.

The treatment of this pathologic condition as recommended in the various text-books on ophthalmology is almost universally the same. All authors agree that the internal administration of

⁷ *Annales d'Oculistique*, November, 1891.

⁸ *Therapeutic Gazette*, February, 1892.

⁹ *Recueil d'Ophthalmologie*, January, 1890.

¹⁰ *Klin. Monatsb. f. Augenheilkunde*, May, 1890.

some form of mercury and the iodid of potassium are the *sine qua non* remedies for internal medication. They agree also as to the efficacy of electricity, the only differences existing being as to which form is the best to use.

Prof. Fuchs, of Vienna, advocates the use of the constant current and says that the induced can rarely be used with success.

Nettleship advises the use only of the Faradic current, while Adolph Alt recommends the application of the Galvanic current.

Noyes advises as preferable the use of the Faradic current, so that one readily sees what a diversity there exists as to which is the preferable form of electricity to use.

My own experience has been that the use of the constant current is much more beneficial at the beginning of the treatment because of its counter-irritant and tonic effect, while later, and especially after an improvement is noted, the induced current can be advantageously substituted. The gymnastic method, of which I have spoken, as first instituted by Prof. Michel in Germany, and brought prominently forward in this country by Dr. Bull, of New York, has, in my hands, proven of much value, and in my estimation should be given a much more prominent position as a method of treatment than it has heretofore received. While in all cases it has not proven to be successful yet in others it has acted most admirably. I find that it is more apt to be successful in those cases where electricity has failed to be of any benefit after a trial of at least two weeks. My method is as follows: After first cocainizing the eye the conjunctiva is seized with the fixation forceps over the affected muscle and the eye rotated in the directions normally made by that muscle when not paralyzed, instructing the patient to aid you by voluntarily turning the eyes in the direction of the forced movements. These forced movements are made about half a dozen times at each sitting, this latter occurring at first daily and then at longer intervals. As a final word, however, never forget to look thoroughly into the general condition of the patient.

GRADUATION OF THE ARC ON JAVAL'S OPHTHALMOMETER; AND GRADUATION ON A STRAIGHT ARM.

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IN the early part of this year the attention of the New York Ophthalmological Society was called to the question of *double* movable *mires* by A. E. Davis, M. D. This subject calls for some suggestions as to the regraduation of the arc; and the further question of an equivalent graduation on a straight arm invites the construction of such an arm. This paper proposes chiefly the discussion of the following propositions: (1.) the finer markings on the arc indicating the radius of corneal curvature as constituting an arithmetical series; (2.) the graduation of the arc for double movable *mires*; (3.) the graduation on a straight arm for a single movable *mire*; (4.) the graduation on a straight arm for double movable *mires*.

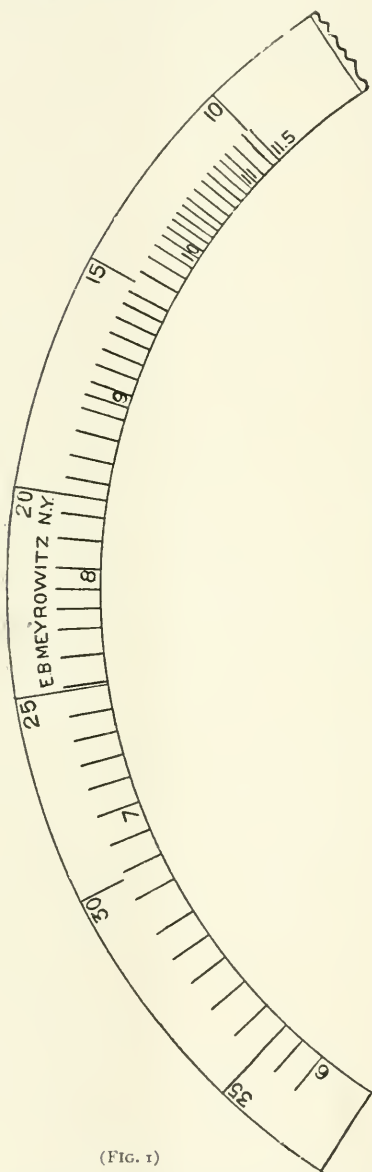
It may be worthy of note that the finer markings on the arc, when they are properly distanced, indicating the radius of curvature of the cornea, vary in the lengths of their spaces by a common difference which shows them to be in the order of an arithmetical series; and the results of this series agree substantially with those derived from the relation of object, image, distance and radius of curvature (O. I. D. R.). By calculations from the radius of curvature of the arc, Fig. 1, and from the logarithmic functions, the distances between the markings may be determined. The last space at 10 is found to be practically 1.5 mm: and the full length of this arc from 6 to 10 is about 122 mm. In an arithmetical series the solution of a problem is derived from the well-known algebraic formulæ, $l = a + (n - 1) d$; and $s = (a + l) \frac{n}{2}$, in which a represents the first term of the series, l the last term, d the common difference, n the number of terms and s the sum of all the terms. In this problem $s = (a + l) \frac{n}{2} = 122$, in which s and l are both unknown quantities. The question now becomes,

what number which when added to a and the sum multiplied by $\frac{n}{2}$ becomes = 122? For convenience x may represent this number, and remembering that n on the arc is at once 40, then

$$(a + x) \frac{n}{2} = 122; (1.5 + x) 20 = 122 \text{ or } x = 4.6, \text{ i. e. } l = 4.6 \text{ mm.}$$

From $d = \frac{1}{n-1}a$ by substituting the values above, $d = .0795$ or practically .08 mm. Having determined the values of the different quantities it is an easy matter to find in this series any number or the sum of any numbers. Thus, $l = a + (n - 1) d = 2.2$ mm, length of space at 9.1 on the arc; $s = (a + l) \frac{n}{2} = 19$ mm, length of arc from 9 to 10; $l = a + (n - 1) d = 3.01$ mm, length of space at 8.1; $s = (a + l) \frac{n}{2} = 26.5$ mm, length of arc 8 to 9; $l = a + (n - 1) d = 3.8$ mm, length of space at 7.1; $s = (a + l) \frac{n}{2} = 34.4$ mm, length of arc 7 to 8; $l = a + (n - 1) d = 4.6$ mm, length of space at 6.1; $s = (a + l) \frac{n}{2} = 42.6$ mm, length of arc 6 to 7; $s = (a + l) \frac{n}{2} = 122$ mm, distance from 6 to 10.

From slight inaccuracies in the measurement of this arc by the instrument maker the length of the entire arc may vary from one to two millimeters—a difference so slight as to practically amount to nothing. By the actual solution for R , and from the series above, it is evident that no two spaces on this arc in Fig. 1 ought to be equal: beginning at 10 and going along the scale to 6 the intervals gradually increase in



(FIG. 1)

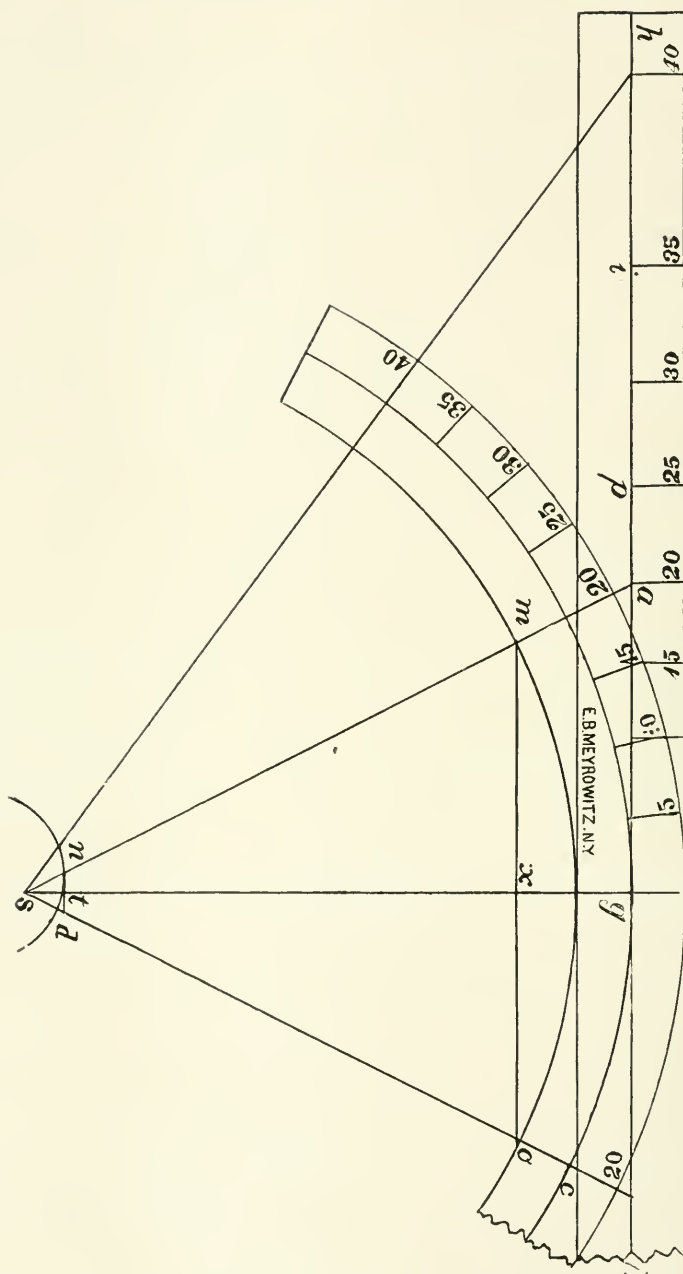
length. In his excellent work, "Errors of Refraction," Dr. Valk, concerning this arc, says, "on the right hand side of the inner

circle we have a series of spaces from 6 to 10, each space being divided into 10 equal parts." Now this is plainly an error: for while, owing to imperfect mechanical construction, this may be true of parts of the arc, it ought not to be true of any part of it, as has already been shown, and will further appear in the course of this discussion.

If the size of an object, its distance from a convex mirror, and its image on the mirror are known, the radius of curvature of the mirror may be found: or if any three of these terms, O. I. D. R. be given the fourth may be easily obtained. Valk determines the value of R from $O : I :: D : \frac{R}{2}$ or $R' = \frac{2ID}{O}$. For strictly close work this equation might not be considered sufficient. If the value of R is derived from $O : I :: D + \frac{R}{2} : \frac{R}{2}$, or $R'' = \frac{2ID}{O-D}$, the results for the radius of curvature of the cornea will be found to be more nearly correct. Thus, if the radius of curvature of the *inner* rim of the brass arc be taken at 27 cm. then R'. from the first equation, when the *mires* are at 20 diopters, is equal to 8.1 mm. Whereas by the second equation $R'' = 8.22$ mm. In consequence of this formula for R, Valk's values for the markings of the radius of corneal curvature on the inner edge of the metal arc would be a little too small all the way from 6 to 10. R' differs from the value of R on the arc of Javal's ophthalmometer by .3 mm.; whereas R'' will agree with it to within about .2 mm. from 6 to 10. This difference between R' and R'' might be considered so slight as not worth disputing: for Helmholtz and others frequently use the formula R' for practical work.

It has been interesting to investigate the numbers on the arc as constituting an arithmetical series when only one of the *mires* is movable. In case both *mires* are movable, it requires a re-graduation of the arc for both the radius of curvature, and the spaces registering the number of diopters. For the number of diopters, it is only necessary to double the spaces on the arc, making each space one-half its present value, and changing the numbers 10, 15, 20, etc., to correspond accordingly.

But the new scale, for double movable *mires*, for the radius of curvature must be determined by a series of calculations, in which the formulæ derived from $O : I :: D + \frac{R}{2} : \frac{R}{2}$, play an important part. These computations are based on the following relations: In Fig. 2, $sg. = 28.25$ cm., which, it is evident by inspection, is the radius of curvature of the middle of the arc. The focal distance of the instrument is taken at 28.1 cm. — being the focal distance the manufacturer aims at in the construction.



(FIG. 2.)

tion of the ophthalmometer. If the radius of curvature be taken at 28.25 cm. it places the *mires* in the middle of the arc.

In the following table column A exhibits the number of diopters on the arc for a single movable *mire*; B, the number of diopters when both *mires* are movable; R, the radius of corneal curvature expressed in millimeters:

A	B	R	A	B	R	A	B	R
16.59	13.19	10.4	18.92	17.94	9.1	22.03	24.06	7.8
16.75	13.51	10.3	19.13	18.26	9.0	22.31	24.62	7.7
16.91	13.83	10.2	19.34	18.68	8.9	22.60	25.20	7.6
17	14	10.1	19.55	19.11	8.8	22.89	25.78	7.5
17.25	14.50	10.0	19.78	19.74	8.7	23.20	26.41	7.4
17.41	14.82	9.9	20	20	8.6	23.52	27.03	7.3
17.59	15.18	9.8	20.24	20.48	8.5	23.84	27.68	7.2
17.77	15.54	9.7	20.47	20.95	8.4	24.17	28.34	7.1
17.95	15.91	9.6	20.72	21.44	8.3	24.51	29.02	7.0
18.14	16.28	9.5	20.97	21.94	8.2	24.86	29.73	6.9
18.33	16.64	9.4	21.22	22.44	8.1	25.22	30.45	6.8
18.51	17.03	9.3	21.48	22.97	8.0	25.60	31.19	6.7
18.62	17.24	9.2	21.75	23.50	7.9	25.98	31.96	6.6

Inspection of this table shows that if one of the *double* movable *mires* stands on the arc at 17 D. that it really registers 14 D.; and that 17 must be erased from the arc and 14 written in its place. So of all the other numbers in column A—they must give place on the arc to the numbers in column B. Thus the graduation of the arc as it now stands is easily converted into a re-graduation which will read the diopters for *double* movable *mires*. In column A, 17, 17.5, 18, 18.5, 19, 19.5, 20, 20.5, etc., are respectively equal to 14, 15, 16, 17, 18, 19, 20, 21, etc., in column B.

So much for the graduation of the arc for both single and double movable *mires*. Let it now be required to graduate the equivalent of this arc on a straight arm as shown in Fig. 2. Carl Weiland, M. D. (History and Principles of Keratometry: its value and limitations in the correction of Astigmatism, *Archiv. of Ophth.*, Jan., 1893), in discussing the distance from object to image, etc., says: "this [arc] ought to be a straight line, because on an arc the distance d of object and cornea is continually changing, just as the distance of a chord from the center of a circle is changing as long as the chord changes." But when this arc is projected on a straight line the objection which he urges against the arc, is found to obtain with equal force against the right line. By reference to Fig. 2, it will be seen that wherever the *mire* m is located it is always at the distance mn from the cornea ntd , and that tx is a variable, while mn is a fixed quantity. It will be noted that sx is the natural cosine of msx : when the *mire* m moves on the arc toward o , then tx increases, whereas mn remains fixed. If the

mire m is made movable along a right line such as $g h$, then $g s$ becomes a fixed quantity while the secants $h s$, $i s$, $a s$, etc., are constantly changing their value D.—*i. e.*, every time the *mire* is moved its distance from the cornea changes.

But in order to show the possibilities of this instrument, and to answer a demand for its solution, it can be demonstrated that a straight arm may be constructed in such a manner as to register all the elements ascertained by the arc. This construction will include the graduation of the arm for (1.) a single movable *mire*; and (2.) double movable *mires*. In Fig. 2, sg is = 28.25 cm.; the arm is 2.5 cm. in width; the *mires* move along the line $g p h$. It may be shown that the $\sin m s x = \frac{m x}{m s}$, from which the angle $m s x$ is found to be $21^{\circ} 45'$. Then $\tan. a s g = \frac{a g}{s g} = \frac{a g}{28.25}$ or $a g = \log. 28.25 + \log. \tan. 21^{\circ} 45' = 112.7$ mm.; so that when the *mires* are set at 20 D. on the arm which corresponds to 20 D. on the arc, the distance from g to a is 112.7 mm. By a series of calculations the tangents from 1 to 40 along this arm may be determined. The following table shows the lengths of the tangents calculated from g and beginning at 5 on the scale:

No. D.	Tang.	No. D.	Tang.	No. D.	Tang.	No. D.	Tang.
5	26.89	14	76.88	23	131.8	32	196.34
6	32.31	15	82.68	24	138.4	33	204.4
7	37.75	16	88.53	25	145.1	34	212.68
8	43.29	17	94.45	26	151.92	35	221.2
9	48.73	18	100.46	27	158.94	36	229.86
10	54.27	19	106.54	28	166.07	37	238.9
11	59.85	20	112.7	29	173.37	38	248.25
12	65.48	21	118.97	30	180.84	39	257.92
13	71.15	22	125.34	31	188.43	40	267.93

Thus when the *mire* is at 5 D. it is 26.9 mm. from g ; when at 15 D. its distance from g is 82.68 mm.; when at 25 D. its tangent is 145 mm. By calculating the values of a , l , d , n in $l = a + (n-1) d$, d is found to be practically = .033 mm. or one-thirtieth of a millimeter; and therefore the tangents for the graduation of the straight arm, with a single movable *mire* are found to exist in the order of an arithmetical series as already shown in case of the markings on the brass arc for the value R. This common difference of .033 mm., by carrying the results to four decimal places is found to be substantially correct up to 25 D.

Since the markings have been established on this right line for the reading of the diopters it now becomes necessary to graduate the readings for R. Bearing in mind that D = 28.25 cm.;

$I = 3\text{ mm.}$; with O . determined by the position of the *mire*, from $O : I :: D + \frac{R}{2} : \frac{R}{2}$ the values of R are tabulated below:

No. D.	R.	No. D.	R.
10	11.5	22.5	8
12.5	10.4	25	7.6
15	9.8	27.5	7.2
17.5	9.3	30	6.8
20	8.6	32.5	6.4
22	8.1	36.25	6

The last part of this question remains for solution—*i. e.*, the graduation of the arm for double movable *mires*. It becomes necessary to compute the values of the lengths of the spaces indicating the number of diopters, by calculating from the logarithmic functions of a double set of tangents. By the method already explained these values are found as in the following table beginning at 10:

D.	Tang.	R.	D.	Tang.	R.	D.	Tang.	R.
10	54.27	.....	17	94.45	9.2	24	138.4	7.8
10.5	57.05	.....	17.5	97.44	.....	24.5	141.63	.....
11	59.85	.....	18	100.46	9.5	25	145.1	7.6
11.5	62.66	.....	18.5	103.50	.....	25.5	148.51	.....
12	65.48	10.7	19	106.54	8.8	26	151.92	7.46
12.5	68.31	.....	19.5	109.60	.....	26.5	155.43	.....
13	75.15	10.4	20	112.70	8.6	27	158.94	7.3
13.5	74.01	.....	20.5	115.82	.....	27.5	162.48	.....
14	76.88	10.1	21	118.97	8.3	28	166.07	7.1
14.5	79.77	.....	21.5	122.14	.....	28.5	169.7	.....
15	82.68	9.8	22	125.34	8.1	29	173.37	7.
15.5	85.58	.....	22.5	128.56	.....	29.5	177.07	.....
16	88.53	9.6	23	131.8	7.99	30	180.84	6.8
16.5	91.48	.....	23.5	135.09	.....	32	196.34	6.6

By the methods previously adopted R may be determined for any number of diopters; its values have been placed in the above table, for the graduation of the straight arm for double movable *mires*. So it is seen that the distance on this arm from g . to 10 D. = 54.27 mm.; to 15 D. = 82.6, and so on to any number along the scale. In the case of *double* movable *mires* neither the arc nor the arm needs to be graduated beyond 30. Of course it is understood that in Fig. 2 that part of the diagram lying in the direction of gc and gk is intended to be the duplicate of the part on the side ga . It is plain to observe that the spaces on the straight arm are unequal in length: thus the tangent in the last table for 20 D. is given 112.7 mm.; 21 D. is given 118.9; their difference is 6.2; the difference between 21 D. and 22 D. is 6.4;

the difference between 22 D. and 23 D. is 6.5. These differences between the tangents give the length of the spaces between the diopters; the length of the space from D. 20 to D. 21 is 6.2; 21 D. to 22 D. is 6.4; 22 D. to 23 D. is 6.5 mm.

Dr. A. E. Davis who has a reprint¹ on the use of Javal's Ophthalmometer, and who has given considerable attention to the question of double movable *mires*, is of the opinion that the accuracy of the instrument is increased by having both *mires* movable. He discusses this subject in advance sheets of a paper on the question; and thinks the efficiency of the ophthalmometer will be increased by using double movable *mires*, especially in those cases where the angle *alpha* may be large.

Before the present improved Javal's ophthalmometer, Le Roy and Dubois devised one with a short straight bar for the *mires*. It may be urged against the graduation on a right line for the dioptric measurement, that as the *mires* separate they increase their distance from the eye; and, therefore, their images on the cornea grow smaller. This view is correct; and in high degrees of astigmatism the instrument, theoretically, would register too much. Practically, perhaps, the error would be too small for the instrument to appreciate. This article has not claimed any advantages of a straight arm over the arc on Javal's ophthalmometer; it shows the possibilities of the construction of an arm correctly graduated, without altering any other elements of the instrument.

It will be remembered that Fig. 2 is constructed so as to give the radius of curvature of the middle of the metal arc 28.25 cm. instead of 27 cm. for the inner edge of the arc. This construction makes no difference in the registering of the number of diopters of astigmatism—*i. e.*, in registering the size of the corneal image: it only slightly changes the markings for R; and when close results are derived for the value of R, as in R'', they agree more nearly with the graduation of the present arc than if they were calculated from 27 cm. Judging from the literature on this question, it is generally understood that Javal determined the value of R on the basis that the inner edge of the arc is 27 cm.; and that he considered D. = 27 cm. If this be true then neither R' nor R'' as given previously will agree precisely with the graduation of the present arc—their values being a little too small. But certainly Javal must have used either R' or R''; therefore it can not be

¹ Javal's Ophthalmometer and Atropin in determining errors of refraction. (*New York Med. Jour.*, Sept. 10, '92, and Oct. 8, '92.)

true that $D. = 27$ cm. The tables hercin compiled derive R'' when $D. = 28.25$ cm., and thus it is found that R'' agrees with the arc as now graduated to within about $\frac{1}{10}$ mm. through all the 40 intervals from 6 to 10. R'' is used in the foregoing tables because its results are more nearly correct than R' .

Now it becomes interesting to note that if $D. = 28.25$ cm., and the radius of corneal curvature is determined from $R' = \frac{21D}{0}$, then the values of R' agree exactly with the graduation of the arc, now in use.

If any author has considered the actual solution of the four propositions comprehended in the scope of this paper, the matter has not come to the writer's notice.

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VALUE OF THE OPHTHALMOMETER IN PRACTICAL REFRACTION WORK.¹

BY EDWARD JACKSON. A. M., M. D.

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IN opening a discussion of this subject, as I seek to do by briefly presenting my own experience and some conclusions drawn from it, it may be premised that the practical value of such an instrument depends: first upon what it does, and only secondarily upon the ease with which it can be used and the saving of time that it can effect.

The ophthalmometer measures the corneal astigmatism and, speaking as I now do of the instrument of Javal used for practical diagnosis, this is all that it does. It measures this astigmatism to an accuracy dependent somewhat on the acuteness of vision and accuracy of observation of the user, but mainly upon the exactness of its adjustment and the excellence of its illumination.

In this matter of illumination, it should be remembered that we are seeking to study the reflection from the surface of a transparent medium, and the distinctness of this reflection depends both on the illumination of the object reflected from the surface and on the illumination of the background seen through that surface. The better the illumination of the mires, the better the reflection from the cornea; the feebler the illumination of the iris, the less is the perception of the reflected image interfered with. On this account, it is almost as important to shut off light from the eye under observation, as to illuminate the instrument; and, the best measurements are made with the pupil sufficiently dilated to give a black background. The best illumination I have ever seen was obtained by diffused daylight, the ophthalmometer being placed so as to receive the light from a large window.

With good illumination, a person with accurate vision can measure corneal astigmatism to within 0.25 D., or even to within one-eighth of 1 D. But in practical work on refraction, the corneal astigmatism is of no interest whatever except in so far as it is an index of the total astigmatism.

¹ Read before the American Ophthalmological Society.

How far does the corneal correspond to the total astigmatism?

In five hundred (500) eyes measured with the ophthalmometer, and subsequently studied by other methods, with the aid in all cases under fifty years of age of full paralysis of accommodation, I find the following results:

In 6% of all cases, the corneal astigmatism corresponded exactly with the total astigmatism, both as to amount and as to the directions of the principal meridians. In 16.6% additional, making 22.6%, the amount of corneal astigmatism exactly equaled the total astigmatism. The difference between the two was 0.25 D. in 21.6%; it was 0.50 D. in 20%; 0.75 D. in 11.8%; 1 D. in 4.4%; 1.25 D. in 2.6%, and from 1.50 to 3.50 D. in 2%. Of the 77.4% in which the corneal astigmatism did not correspond with the total, the former was in excess in 62% and the latter in 15.4. In over half of these, 8%, the astigmatism was with the rule, and in 7.4% it was against the rule.

As to the correspondence of the meridians, taking all the cases of astigmatism, it was found that they corresponded exactly in 31% and if to this be added 3.6% in which the direction of the total astigmatism was exactly the reverse of that of the corneal astigmatism, we have 34.6% of cases in which the instrument indicated exactly the direction of the principal meridians. In 4% there was no corneal astigmatism, but some total astigmatism; in 11% there was corneal astigmatism which was neutralized (presumably by astigmatism of the lens), and in 3% there was neither corneal nor lenticular astigmatism and if these be added to the cases in which the meridians were correctly indicated, we find 52.6% of cases in which the indications of the ophthalmometer were not misleading as to the direction of the principal meridians of astigmatism.

In 17% the difference between the meridians was only 50; in 9.6% it was 10°; in 5.4%, 15°; in 8% from 20° to 45°, and in the remaining 7.2% the true meridians were from 5° to 40° from exact reversal.

With reference to the direction of the astigmatism, however, when this is less than 0.50 D., the determination with the ophthalmometer is apt to be uncertain. The mires run up or recede—their axes correspond or break—from point to point as they are swept around the circle. Taking only eyes in which the corneal and total astigmatism each amounted to 0.50 D. or over, numbering 256, I find that the meridians of corneal and total astigmatism correspond exactly, or they were exactly reversed in 44%;

they differed by 5° , or by 5° from exact reversal, in 22.4% ; by 10° in 14.2% ; by 15° in 8.4% , and from 20° to 45° in 11% . That is, in 89% the ophthalmometer showed the direction of the principal meridian to within 15° , while in 11% it did not come nearer than 20° to 45° to the meridians of total astigmatism.

A careful study of my tabulated cases shows that it is quite impossible to adopt any rule of adding to, or subtracting from the corneal astigmatism, either a fixed quantity or a fixed proportion, to obtain the amount of the total astigmatism with greater probability than by assuming an exact correspondence. Thus there was an exact correspondence in 22.6% . If a 0.25 D. was subtracted from the corneal astigmatism, it would give the total astigmatism in 21.2% . If 0.50 D. were subtracted from the corneal astigmatism it would give the total astigmatism in 20% . If 0.75 D. were subtracted from the corneal astigmatism, it would give the total astigmatism in 11.8% . If the total astigmatism were taken as three-quarters of the corneal, it would be correct in 15% . If a subtraction of 0.50 D. were made in cases of astigmatism with the rule, and the same amount added in astigmatism against the rule, as has been proposed by some, the total astigmatism would have been obtained in less than 21% .

It appears, therefore, that while the corneal astigmatism approximates the total in amount and in the direction of its principal meridians, in the majority of cases the approximation is not so close as may be rightfully demanded of the ophthalmic surgeon in his correction of ametropia ; and that in exceptional cases, which are, however, by no means rare, the difference between the corneal and total astigmatism is so great that the former can hardly be regarded as in any proper sense a guide to the latter.

In practical refraction work, therefore, the ophthalmometer is to be considered as a means for approximating the probable amount and meridians of astigmatism. As such a means of approximation it is for certainty to be ranked as superior to direct ophthalmoscopy ; but greatly inferior to skiascopy among objective methods, and distinctly inferior to the subjective tests with the distorted point of light, the slit, or the parallel lines seen through spherical lenses.

What it does, then, places it clearly among the approximate tests. But among such tests the definiteness with which it indicates what it does indicate, the fact that its indications are entirely objective, and the rapidity with which they may be obtained, all give it high rank in this class of approximate tests. It is, too, an easy method of examination to master ; requiring small experience

and simply the same power of observation as is needed for the accurate use of a thermometer or a tape measure. Indeed, so much of its value depends on the care of its original adjustment, and its illumination; and so little on the skill or patience of the observer, that it is liable at some time to become popular among counter-prescribing opticians.

It will be understood that in the foregoing remarks, I referred simply to its value as a practical means of measuring ametropia for the adjustment of lenses, Of the scientific value of the simple determination of the corneal astigmatism, and of its practical value in the determination of astigmatism in the aphakic eye, either of which amply justify its routine use, I have purposely said nothing.

TWO ATYPICAL CASES OF CONGENITAL ANOMALIES OF THE CORNEA, WITH THREE ILLUSTRATIONS.

By H. V. WÜRDEMAN, M. D.
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THE daily routine of medical practice is at times enlivened by the occurrence of rare cases or exceptional complications, which either teach us therapeutic rules or are of interest on account of their infrequency or morphologic value. Some of these are worthy of record, and perhaps if the nature of such were more frequently recognized their existence would not be deemed so rare. Although the therapeutics of congenital malformations is usually unpromising, the study of these strange freaks of nature is of the greatest interest.

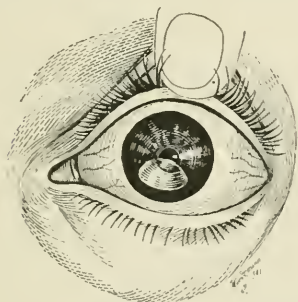
Case I. Congenital staphyloma or coloboma of the cornea with paralysis of the right external rectus, nystagmus and microphthalmos.

Mrs. N. M.; Irish; 50 years of age; consulted me with trachoma and trichiasis with which she had suffered for several years. V.: R. E., = fingers at 1 M.; L. E., = fingers at 3 M.; congenital nystagmus and paralysis of right external rectus. Corneæ small; irides normal; refraction, after she had obtained some relief from conjunctival affection and after the offending eyelashes had been removed by electrolysis, was under mydriatic V.: R. + 2.75, fingers 4 M.; L. + 2.75 = $\frac{6}{30}$. There was a most peculiar defect in lower portion of the left cornea, the like of which I had never seen nor read. A second smaller segment was implanted on the cornea like a little oval watch crystal, 5 mm. high, 7 mm. in width, perfectly clear and of higher refraction so that the subjacent portion of the iris appeared magnified (See Figs. 1—2.)

This was said to have existed as it was since birth. Judging from the absolute transparency of the engrafted tissue and its

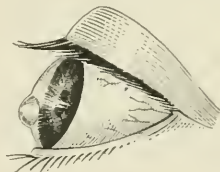
apparent similarity to the true corneal substance, we would suppose that its formation was due to an arrest of development in the fetal cleft rather than to a giving away of a reparative prenatal corneal cicatrix. Against this view is, however, arrayed the statement of Pincus that congenital corneal staphylomata are due to inflammation in the second half of fetal life. To my mind this structure arose from inhibition of growth during development, forming a coloboma of the cornea which in later weeks of uterine life became filled with clear corneal tissue. This view is borne out by the existence of congenital paralysis or absence of right external rectus and nystagmus, and above all by the microphthalmos.

Now ensues an interesting chapter in the history of this case and from my own standpoint, a most disappointing incident. For, on account of the approaching meeting of the American Medical Association in our city, I had resolved to exhibit this case to some



(FIG. 1)

Congenital Staphyloma of Cornea.



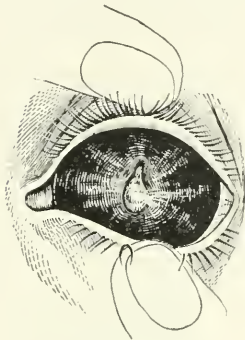
(FIG. 2)

of my confreres in order to obtain, if possible, further light upon its origin. A couple of months before this event the patient appeared in great pain, stating that her child had cut the eye while playing with a comb about her mother's face. On examination I found the "beautiful specimen" irretrievably ruined by the accident. I was obliged to trim the edges of the cut cornea, putting on a compress antiseptic bandage, had little satisfaction in noting the healing of the wound in ten days. The traumatism left a leucomatous patch on a level with the corneal surface. The patient was, on the whole, a gainer by the accident, for the cicatricial contraction doubled the visual acuity of this eye so that V.: R. + 2.75, = $\frac{6}{xxx}$, L. + 2.75 \odot + 1.00, 150°, = $\frac{6}{xxx}$. It is marvelous how long she had carried this protuberance without accident and not a little queer that the traumatism should have happened when the presence of the object was about to prove of some service, if not to the patient, at least to the physician.

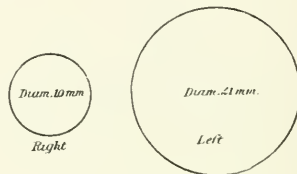
Case II. Congenital bucephthalmos.

M. L., 6 weeks of age, Polish parentage: brought to me presenting an opposite type of congenital corneal defect to the foregoing case. When the lids were closed nothing could be observed about either eye, but on opening them the difference was startling. (See Figs. 3—4.)

The right seemed normal, although from comparison with other infants I was convinced that it was smaller than it should be. Movements of both normal. The left seemed all cornea and iris, but on manipulation a narrow rim of sclera could be observed at the external canthus. This cornea was 21 mm. in width while



(FIG. 3.)

Congenital Bucephthalmos.

(FIG. 4.)

Comparative sizes of Corneæ.

that of the right was 10 mm. The anterior hemisphere was composed of clear corneal tissue. The globe itself was flattened. The tension was even less than normal, so the existing causes (believed in such cases to be glaucomatous) had evidently subsided. There were, however, evidences of the previous existing intra-uterine inflammatory process in opacity of the lens and occlusion of the pupil. The anterior chamber was shallow: the red color of the fundus was faintly discernable by the ophthalmoscope. The case was seen one week later when appearances were apparently the same, but since has been lost to view.

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ARE GUN-CAP WOUNDS OF THE EYE WITHOUT DANGER?

BY C. M. HOBBY, M. D.,
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THE advance reports of the Eighth International Ophthalmological Congress, as published in the *Philadelphia Polyclinic*, besides other surprises, seem to present to the profession at large in the following extract a very dangerous proposition, "Leber (Heidelberg) read a paper on this subject, (Injuries from copper). The highly poisonous nature of this chemical substance is very injurious. Extraction of the body is difficult in most cases. When it is removed, the irritation soon subsides. These injuries are mostly due to percussion caps. The explosion and flame destroy any germs which may be adherent. Hence it is proper to attempt to save eyes so injured, even if there be pus in the vitreous, provided this can be attributed to the chemical and not to infection. *There is, moreover, in such cases (of copper poisoning) no danger of sympathetic inflammation.*" The portion of the extract italicised appears to be diametrically opposed to the experience of ophthalmic surgeons in this country.

In a paper read before the ophthalmological section of American Medical Association, June, 1887, published in the *Journal* of the association, October 15, 1887, the writer gave what has appeared to be the generally accepted American opinion in regard to innocuousness, as follows:

"We must recognize that sympathetic ophthalmia does not, of necessity, follow any particular kind of injury; that a man may go through life with an eye rendered blind by invasion of a foreign body, or that the ciliary region may be punctured by an osage thorn, and an atrophic globe ensue, without the other eye suffering in the least; but we know that in 100 of such cases, uninterrupted with, many would be found blind at the end of twelve years. On the other hand punctures of the cornea, incarcerations of the iris in the cornea, traumatisms of the lens, or wounds of the sclera near the equator, while always carrying an element of danger with them, are not followed in any great proportion of cases by lesion of the other eye. Therefore, I believe the first indication for preventive enucleation is the presence of an inaccessible foreign

body within the eye, or severe injury of the ciliary region of the globe, and that this indication exists, even if there be retained, to use Mauthner's language, '*a certain amount of vision*,' and with me the '*certain amount*' would be *considerable*, if the patient had a piece of gun-cap within his eye.'

It must be borne in mind, that in a country where there is no restriction placed upon owning and using fire-arms, and where nearly every boy, away from large cities, begins to handle guns as early as 14 years of age, the opportunity for gun-cap accidents is increased many times beyond that existing upon the continent of Europe. That retained gun-caps do produce sympathetic ophthalmia with great frequency can be verified in any of the institutions for the blind. Before the hypothesis of infective origin of sympathetic ophthalmia was advanced, it was generally believed, in this country, that wounds from gun-caps were *more* prone to be followed by this dreaded result than any other traumatism. My belief was, and is, that the part injured, not the material injuring, is the determinant of sympathetic ophthalmia. As preventive enucleation has been practiced in all cases under my care, when the ciliary region was involved in a wound made by a perforating gun-cap, I have not been able to watch many cases through the development of this condition. A few cases, however, have come under observation where fragments of gun-caps have been retained within the eye, and these I append to show that copper is as dangerous as steel from a clinical point of view. These cases are all the private cases of gun-cap wounds, where preventive enucleation was not practiced, excluding thus a number of cases where the so-called sympathetic irritation foreboded the approach of trouble. In addition to these cases, I have seen not less than twenty in the College for the Blind, of Iowa, in whom the blindness of the second eye followed, and was probably due to gun-cap wound, usually with retained fragment.

Case I. Piece of gun-cap retained eleven years without sympathetic ophthalmia.

T. M., 22 years of age, eleven years previously received a fragment of a gun cap in the R. E., striking the globe near the center of the cornea. Lens absorbed, capsule attached to iris, iris discolored, no perception of light. L. E. normal.

Case II. Sympathetic ophthalmia twenty years after gun-cap wound.

W. P. W., 43 years of age, twenty years ago right eye was injured by a piece of gun cap which it was supposed was removed a month later, but by that time vision was entirely gone in the right eye. No further trouble until three months ago, when the left eye began to fail. When examined there was found occlusion of the pupil, complete circular synechia, vision = $\frac{16}{128}$, a month later there was bare perception of light.

Case III. Sympathetic ophthalmia one month after gun-cap accident.

W. D., 12 years of age, struck in right eye with a fragment of gun cap four months ago, the fragment passed through the ciliary region into the globe, an unsuccessful attempt to remove the metal was made at the time. One month after injury, sympathetic ophthalmia developed in the left eye, which at the time of examination was already atrophic.

Case IV. Fragment of gun-cap retained four years without injury.

E. M., 17 years of age, struck in left eye four years ago with a fragment of a gun-cap which passed through the cornea, iris and lens, vision lost at once. Right eye still retains normal vision.

Case V. Injury by gun-cap followed by disease of the other eye, of doubtful relationship.

J. M. B., 37 years of age, struck in the right eye with a fragment of a gun-cap, twenty-eight years ago, immediate loss of sight of the injured eye. The left eye gives with — 12 D. S. = $\frac{2}{128}$. The vitreous is filled with floating bodies, and masses of choroidal pigmentation can be seen with difficulty.

I have notes of several cases where steel has been retained ten years or more, without affecting the other eye; one in which lead, a No. 6 shot, was retained sixteen years; and a case now under observation in which a 22-caliber bullet has been retained four years without injury to the other eye. On the other hand, sympathetic ophthalmia has occurred several times in my experience after a foreign body has remained in quiet more than twenty years. The opinion of the writer, based upon over five hundred cases of traumatism involving penetration of the globe by accidental causes, is that injury of the ciliary region of the globe is the clinical factor of greatest importance in predetermining sympathetic ophthalmia; unless the ciliary region be injured, a foreign body may remain innocuous in the eye until, perhaps after many years, the slow processes of degenerative change, especially those resulting in the formation of bone, reach the region of danger; and when this occurs even after fifty years, the other eye is at once in jeopardy. I have never regretted advising the prompt removal of a hopelessly injured eye from whatever cause; but scarcely a month passes but some patient appears who must regret through life vainly, that such advice had not been given him earlier.

“The professional errors of one generation become the popular errors of the next;” the random dicta of celebrated specialists are prone to become the law of general practitioners. Physicians reading the ophthalmologic abstracts of the journals, still inject discomfort into the minds of those who have had a proper enucleation, because of the wide-spread belief amongst them of the superior advantages of excentration, and it is to be feared that the foregoing dogma, that eyes containing fragments of gun-caps are in “no danger of sympathetic inflammation,” may serve as an excuse for delay and thus doom many to hopeless blindness.

RESULTS OF SUBCONJUNCTIVAL INJECTIONS IN SOME EYE DISEASES.

BY CHAS. H. BAKER, M. D.,
OF BAY CITY, MICH.

THERE is no claim for priority, in the use of subconjunctival injections, in this report; but believing that few ophthalmologists are personally familiar with the advantages which it offers, the author has collected a few cases to report that others may be encouraged to try the same plans.

Every ophthalmologist knows how protracted are cases of interstitial keratitis, under the older methods of treatment, and results warrant the statement that no other method will give so prompt healing and return of sight as does this.

Case I. Cora G., 12 years of age, was under treatment three or four months with hot fomentations, iodids, mercurials, locally and internally, tonics, and, what had previously given me excellent results, pills of arsenic iodid. Present condition: intense photophobia, with reflex cough brought on by exposing eyes to light, blepharospasm, cornea milky, conjunctiva much congested and vision equals light only.

After thorough cocainizing, one minim of a solution of mercuric chlorid, one part in 30,000, was injected under the conjunctiva of the right eye, below the cornea. In two days the redness and photophobia of this eye were much lessened, and, on the fourth day, a second injection was used in each eye. On the seventh day she could bear to have eyes opened toward the windows, and on the fourteenth, could open them herself. Injections were repeated once in three to seven days, and a complete recovery was had after seven injections. The internal administration of remedies was discontinued after the first injection.

Case II. Master B., referred by the family physician, with commencing interstitial keratitis of one eye, which had lasted about ten days. A number of minute grey spots were scattered over the cornea with haziness between. One injection of the above solution was given, together with a prescription for potass. iodid and pills of mercury protoiodid. The patient did not return, but I was informed by his physician, that he soon recovered and resumed his work.

Case III. B., girl, 12 years of age, one year ago was under treatment, by me, two months, for interstitial keratitis which responded very slowly to specific treatment, rest and tonics. She returned after six months with relapse in both eyes. This patient received biweekly injections of a minim in each eye, for four weeks, when treatment was stopped with vision $\frac{3}{80}$ after correction of her mixed astigmatism. No other treatment was given with the injections.

Case IV. Mr. C., interstitial keratitis from acquired syphilis, confined to one eye, has lasted three or four months. During two weeks received injections once in two and three days, according to the amount of reaction. There was rapid improvement in the amount of irritation in the eye, although the haziness of the cornea was not much lessened. The patient left town, and I have since heard his eyesight is much improved.

The second class of cases which was improved by this treatment was those suffering from choroiditis, and the results were equally good in those of recent and also long standing.

Case I. Mrs. B., 37 years of age, vision good until thirteen weeks ago, when, being pregnant, she had anasarca, a miscarriage, and rapid loss of vision. Ophthalmoscope showed choroiditis, marked at the macula, which resembled a red fern leaf, and a few scattered spots of inflammation outside the macula. There was no exudation, such as would be produced in retinitis albuminurica. Her family physician had given her potass. iodid and strychnin. Vision was $\frac{2}{70}$ — in each eye. She received four injections at intervals during two months. Vision improved from $\frac{2}{70}$ — to $\frac{2}{40}$ — after the first injection. At the time of her last visit V. = $\frac{2}{30}$ +, seven months subsequent to the first visit. This patient lived at a considerable distance from the city and could receive injections at infrequent intervals. She was given mercurial inunctions for a short time, but soon discontinued them. She also had potass. iodid for about four months, so that not all her improvement could justly be credited to the injections.

Case II. Mr. F., 35 years of age, at his first visit V. = fingers at one foot, to outer side of field, elsewhere *nil*. He received one injection and in two days vision equaled fingers at twenty inches over entire field except small central area. Choroid at macula very red. Has a few atrophic spots about macula of left eye from an attack a year ago. O. S., V. = $\frac{2}{30}$ —. Eight days after the second injection V. = $\frac{2}{100}$. Macula much improved in appearance. Thirteen days later V. = $\frac{2}{50}$. He received no other treatment, yet in twenty-three days vision increased from practically nothing to $\frac{2}{50}$. The patient now discontinued his visits.

Case III. L. G., 36 years of age, has been under treatment the past three years for neuro-retinitis and choroiditis. Treatment has consisted of mercury internally and hypodermatically and by inunction, also potass. iodid in 20 to 40 gr. doses three times daily, and his vision has fluctuated from light perception to $\frac{1}{70}$. Under a course of hypodermics in December, 1893, O. S., V. = $\frac{2}{30}$ and O. D., V. = $\frac{2}{30}$ —.

On May 21, 1894, vision was reduced to $\frac{2}{300}$ and $\frac{2}{30}$ — respectively. June 3, after four injections, O. S., V. = $\frac{2}{70}$ and O. D., V. = $\frac{2}{20}$, which was better vision than he ever obtained by any other plan of treatment.

Neuro-retinitis uncomplicated by choroiditis I have found to yield well to this treatment.

Case I. Mr. H., 41 years of age, neuro-retinitis, probably syphilitic and alcoholic. O. S., V. = $\frac{1}{50}$, O. D., V. = $\frac{1}{40}$. Under 30 gr. doses of potass. iodid, vision increased in thirty days to $\frac{2}{40}$ and $\frac{2}{30}$ respectively. Subconjunctival injections were now begun and vision rapidly rose to $\frac{2}{20}$. This man attributed his loss of sight to the medicine received at one of the "cures" for inebriates.

These few cases serve as an index to the kind which are most amenable to this treatment. As is to be expected, the syphilitic cases are most rapidly benefited, and as it has been shown by Phlüger that after such injections the mercuric chlorid may be demonstrated in the cornea, aqueous, super-choroidal space, vitreous and superficial layers of the lens; the reason is plain. Instead of scattering your medication over the whole body, most of which may be free of syphilitic lesions, the remedy is concentrated at the point where needed. A little mathematical calculation will demonstrate the greater quantity to be introduced into the eye by this kind and size injections, than by hypodermics in other regions, and any one who will try will easily be satisfied that the irritation is nothing compared with the larger doses, $\frac{1}{10000}$, which have been recommended, and the results equally good if not better. In one of these cases one minim of a $\frac{1}{10000}$ solution was injected, with the result of almost driving the patient away by causing severe reaction with positive deterioration of vision, which rapidly gained again when the mild injections were resumed.

I have not tried this treatment in septic cases as yet but shall do so at the first opportunity.

The injection should be made after thorough cocainizing at a considerable distance from the cornea, the patient sharply rolling the eye up and in or out as required. Puncture of vessels is also to be guarded against, the resulting discoloration being very objectionable in appearance.

An objection to the validity of these cases may be made; that the treatment in most of them was not unmixed and therefore not all the results could be attributed to the injections: but among private patients it is unsafe to attempt untried methods, to the neglect of those that have proved valuable, lest the failure of the first plan may lose the case. In any future case, of the kinds here given, however, I would not hesitate to try this plan, to the exclusion of any other.

THE TOXIC AMBLYOPIAS; THEIR SYMPTOMS, VARIETIES, PATHOLOGY AND TREATMENT.

BY CASEY A. WOOD, C. M., M. D.,
OF CHICAGO.

[Continued from Vol. III, page 287.]

BELLADONNA AND ITS ALKALOIDS. In addition to the symptoms detailed on page 176 there are several instances recorded where *glaucoma* has resulted from the external application of mydriatics. In two instances, also, optic nerve atrophy with contractions of the visual field are said to have been caused by their use, but these cases are not well authenticated.

The ocular symptoms occasioned by cycloplegic derivatives from the *solanaceæ* order are probably of peripheral origin. The poison acts by paralyzing the ends of the third nerve distributed to the ciliary muscle and sphincter iridis as well as, *perhaps*, by stimulating the sympathetic dilator fibers.

General as well as local symptoms from the use of other cycloplegic agents are too well known to spend much time upon them.

Kollock (160), in common with many others, the author included, has observed serious symptoms after the instillation of such a small amount as $\frac{1}{60}$ gr. of *duboisin*.

Ziem (161) as well as de Schweinitz and Hare (162) report cardiac weakness after the local use of *homatropin*. Harlan (163) has seen the same drug bring on slight attacks of glaucoma, while Cheney (164) witnessed what he terms "hysterical" mydriasis and blindness following the use of the hydrobromate.

Testi (165) saw well marked cycloplegia and mydriasis in a family poisoned by *hyoscyamus albus*.

Treatment. Owing to its stimulating action upon the third nerve center, opium, and especially hypodermic injections of morphia, in full doses is the most appropriate and most useful form of treatment in cases of poisoning from the cycloplegic alkaloids. McGowan (166), in a case of typical intoxication following a teaspoonful of belladonna liniment, used hypodermic injections of pilocarpin with gratifying results.

Although *nicotine* and *eserine* stimulate the nerve endings of the oculomotorius, their miotic action is feeble, and even large doses do not neutralize the ordinary parietic effects of belladonna or hyoscyamus. The statement of Loring (167), that no visible changes in the retinal vessels are produced by poisoning, agrees entirely with the results of my investigation (page 177) of opium amblyopia.

OPIMUM AND MORPHIA. The experiments of Picard (168) on dogs, and the observations of Laborde (169), in a case of chronic poisoning from morphia, would appear to prove that these agents do occasionally affect the optic nerve and retina and so produce visual disturbances. In addition to Wagner's case (37) previously quoted, Schreiber (170) observed agraphia and alexia after acute poisoning. Schiess-Gemuseus (quoted by Knies), reports a case of a man, aged 65, who, after taking a morphia sleeping powder and having slept thirty hours, became almost blind and deaf. He not only had, after an interval of three weeks, a right-sided hemianopia but a persistent contraction of the visual field on the left side. The right papilla presented the appearance of a tobacco disc, *i. e.*, hyperemia of the nasal half with palor of the temporal side.

ACONITE. Many other observers besides O'Brien (38) and Hooper (171) have recorded *mydriasis* without cycloplegia as the chief ocular symptom of aconite and aconitia poisoning, although Haakmar, and a few others, in a case (172) from aconitia nitrate mention this sign as alternating with miosis. In a fatal case from the nitrogallate of aconitia, Buscher (173) noticed that the patient had attacks of complete blindness. Woodburg's case (174) exhibited misty vision and diplopia.

CHLORAL AND ITS HYDRATE. Most authors agree with Griffith (175) that after the continued use of chloral, the pupil almost invariably becomes contracted, but later on psychic alterations set in and then the pupillary contraction gives place to dilatation. The *miosis*, which is the symptom most commonly observed, is associated with loss of the normal pupil-dilatation-reflex from irritation of the sensory nerves in the ocular neighborhood. This contraction of the pupil is the result of paresis of the sympathetic nerves supplied to the iris.

Usually there are no fundus changes, although Berger speaks of a congestion of the papilla, when *mydriasis* is present, due to congestion of the retinal veins. Ulrich (176) says that in the later stages slight pressure upon the globe is sufficient to force the blood out of the papillary vessels and that the intraocular tension

is lessened. There is then an anemia of the retinal vessels. Cheatham (177) has had two cases of photophobia and conjunctival hyperemia, which he ascribes to chloral, having seen them follow a single dose of 15 grains. Visual disturbances, due to organic alterations, are very rare.

Mittendorf (178) had a patient who had been taking 2.5 to 3 grms. of chloral hydrate daily. There were greatly impaired vision and small central scotomata for red and green, while the papillæ were muddy. Chloral stopped and strychnia administered. Improvement began in four days: in three weeks vision was two-thirds with no scotoma. Kirkpatrick Murphy (180) observed in a woman, 58 years of age, who took 150 grains daily, dimness of sight, eyes bloodshot and constantly watering, pupils dilated and temporary amaurosis lasting two days.

Treatment. Very little is known about it. C. J. G. Sinclair Coghill (179) is an advocate of amyl nitrite, and in a case of complete miosis from chloral used the former remedy with success.

ESERINE. Although this agent, as well as extracts of Calabar bean, are well known miotics when used locally, yet systemic intoxication generally causes *dilatation of the pupil*. C. Aragô (181) has seen complete, though temporary, blindness follow general eserine poisoning in a 10-year old child, which, by the way, most commonly results from its instillation into the conjunctival sac.

PILOCARPIN AND JABORANDI. Locally always powerful miotics, the chief eye symptom in *general* poisoning is, as with physostigmine, mostly *mydriasis*. Fuhrmann (182) relates a case of luetic papillo-retinitis in which a hypodermic injection of 0.01 grm. of pilocarpin was given. Alarming symptoms set in accompanied by an amblyopia lasting two hours and a half. The patient could not recognize a person at 20 centimeters, although his left eye before the poisoning had normal vision. In an article on the subject Landesberg (183) gives his experience of five cases treated with pilocarpin and jaborandi in which he observed sooner or later a quickly developed *cataract*.

Says Berger, "although exceptional cases of transient amblyopia or of cloudy vision are commonly explained by the hypothesis of a disturbed intraocular circulation, it is more probable that pilocarpin, in poisonous doses, temporarily paralyzes the peripheral fibers of the optic nerve."

COFFEE AND CAFFEIN. Strong solutions of caffein and its salts applied to the cornea act as a weak mydriatic and anesthetic.

Hutchinson (184) refers to a case of caffein amblyopia, the symptoms of which resemble those of the amblyopia of quinin intoxication.

ANILINE AND ITS SALTS. Almost every observer has noticed *mydriasis* and *accommodative paresis* as the chief signs of chronic poisoning. In Leboir's case (185) the dilatation was extreme. Müller (186), on the other hand, observed bilateral miosis. There was defective vision, Jaeger XIX, in each eye, (which improved when the patient abandoned his injurious work) in a case reported by MacKinlay (187).

COAL GAS AND ITS COMBUSTION PRODUCTS. Intoxication from poisonous combustion products, especially from carbon monoxid and *carbon dioxid*, as well as from the *hydrocarbons* and other compounds in *illuminating gas*, is occasionally accompanied by ocular symptoms. This is not to be wondered at when one remembers the widespread organic alterations, particularly capillary hemorrhages and fatty metamorphoses found after death in brain, nerves, muscles, kidneys, etc. *Where recovery occurs the eye symptoms are usually due to similar changes in various parts of the visual apparatus.* The minute hemorrhages, that also occur in phosphorus poisoning, are the results of fatty degeneration of the capillary vessels.

A most interesting history is given by Knapp (198). The patient, exposed to the fumes of an imperfectly covered stove, suffered from loss of consciousness after which he had paralysis of several ocular muscles. In the course of two months there was partial recovery, the paralysis being then confined to the ciliary muscle and sphincter pupillæ.

Illing (189) reports a case of homonymous hemiopia due to cerebral disease, while Emmert (190) more recently records a paresis of the third nerve (left eye only) associated with a partial trigeminus and facial paralysis. Recovery in this case was almost perfect.

Retinal hemorrhages have been observed by Becker (191) and others. In Becker's case there was marked congestion of the retinal veins.

Pure carbon dioxid poisoning presents no constant eye symptoms. A mechanical congestion of the retinal veins, as a part of a general venous stasis partly due to asphyxia, has been noticed in association with fundus hemorrhages. Sometimes the pupil is dilated; sometimes contracted. Ball (192) records a curious fact: while the patient was suffering from the effects of the poisonous inhalation the pupils dilated when light was allowed to fall upon the eyes and they contracted in the dark!

Herpes zoster affecting the eye through alterations in the ocular branches of the trigeminus has been observed by Sattler (193).

PHOSPHORUS. There is a close resemblance between the morbid changes in the tissues of persons affected by this intoxicant and those of persons poisoned by one or both of the oxides of carbon. The ocular symptoms and tissue alterations are for that reason much the same in both instances. In chronic intoxication, [Michel (194)] affecting workers in match factories, for example, hemorrhages and patches of degeneration in the retina are sometimes seen. The latter are composed of the altered (fatty) external granular layer, mixed with crystals of tyrosin. The process begins with a fatty degeneration of the retinal capillaries in the same way that phosphorus poisoning affects the smaller vessels elsewhere; an ophthalmoscopic picture that resembles the retinitis of albuminuria.

SULPHURIC ACID. This is a rare cause of visual disturbance. Salomonsohn (195) reports a case of acute polioencephalitis superior (produced by poisoning from this acid) which in its turn caused progressive paralysis of the eye muscles, ending in complete ophthalmoplegia. The patient recovered and the eye symptoms disappeared. Georges Martin (196) also publishes an instance of blindness, the result of sulphuric acid poisoning.

ETHYLENE DICHLORID. Dutch liquid. This colorless, inflammable fluid has been used as an anesthetic, especially under the modified form of *ether anestheticus aranü*. Raphael Dubois (197) noticed that after inhalations of it, dogs and rabbits acquired persistent opacities of the cornea. Panas (198) believes these to be due to serous infiltration of the true substance of the cornea dependant upon a destruction of portions of Descemet's membrane by the ethylene chlorid. In this way the parenchyma is exposed to the action of the aqueous humor.

POTASSIC BROMID. In addition to the case already detailed (*vide ante*) Schweig (199) reports a case in which slight *mydriasis*, lasting several days, and conjunctival catarrh were the principle ocular signs of the bromism. Berger attributes the dilation of the pupil either to the parietic action of the bromid on the sphincter pupillæ or to a contraction of the vessels of the iris. The amblyopia is probably due to the *mydriasis*, as no fundus changes have been reported.

IODIN AND IODIDS. Edema of the lids, as in Hewkley's case (200), accompanied by lachrymation and pains in the eyes, as seen in the case of Lorenz (201), constitute the ordinary symptoms of ocular iodism, as part of a general intoxication.

The following histories must be regarded with suspicion, as the alleged ocular poisoning occurred in patients with syphilis. Ehrmann (202), in a case of acute iodism, observed not only the usual symptoms just mentioned, but in four instances severe trigeminal neuralgia with tender "pressure" points. These disappeared when treated by quinin.

I present the following case: "Mrs. M., 36 years of age, in November, 1893, observed failing vision. It seemed as if a cloud were floating before the eyes. She applied for treatment to a well known ophthalmologist, who prescribed potassic iodid in increasing doses, combined with 'mixed treatment.' Has taken 200 grains of K. I. at a dose. After being under treatment for several months it was noticed that when the iodid was stopped vision improved, and invariably got worse when full doses were resumed. Finally, the surgeon was obliged to return to very small doses and at last to stop the drug altogether, owing to its untoward effect. Patient afterwards consulted me and I had a similar experience with her. The lesion was a *hyalitis* (V., R. = $\frac{20}{00}$; V., L. = $\frac{15}{00}$) which eventually greatly improved."

METHYLEN BICHLORID. This anesthetic fluid, allied to chloroform and said to be a mixture of it and methylic alcohol, produces eye symptoms the direct opposite of the former (*q. v.*) viz: *miosis* in the first stage of the narcosis, but *dilated pupils* in the later stages.

CHLOROFORM. Aside from the condition of the pupil in the various stages of chloroform narcosis there are no ocular symptoms, properly so called, pathognomonic of this intoxicant. Niemann (203) records a case of acute poisoning from drinking chloroform: the man first presented contracted and, later on, dilated pupils.

Schlaeger (204), Vogel (205) and Budin (206) have made elaborate studies of the pupillary reflexes in persons under the influence of chloroform, investigations that add very little to the everyday experience of the surgeon.

During the period of excitement the pupil is dilated, but as the inhalation proceeds and the medulla and cerebral centers become paralyzed the pupil contracts—a well marked miosis indicating that the anesthesia is complete.

ETHER. The pupillary signs are much the same as with chloroform. but Jacob (207) noticed, six times, mydriasis instead of miosis in the stage of deep narcosis out of 1200 etherizations. As a result of a study of these signs Warner (208) reports a disassociation of the usual binocular movements under chloroform which is not exhibited by ether.

Detachment of the retina. probably as the result of efforts at vomiting, has been recorded by several observers. *e. g.*, by Schirmer (209).

ANTIPYRIN. Wicherkiewiez (210) claims that this drug produces an amblyopia similar to that of sodic salicylat. Guttman (211) observed in a debilitated woman, 25 years of age, a complete though evanescent blindness, which came on after a dose of 15 grains.

NITROBENZOL. Another case described by Nieden (212). should be added to Litten's (55) report. A workman in a "roburite" factory suffered for two weeks from general poisoning, difficult respiration, cardiac palpitation, vertigo, nausea, weak pulse, etc., before the eye symptoms set in. These were failing sight (the visual acuity being reduced in either eye to $\frac{1}{20}$) and gradual but marked contraction of the F. of V. After an interval of four weeks hyperimprovement set in. The ophthalmoscope showed a decided hyperemia of the veins with (in one eye) a large retinal hemorrhage.

SULPHONAL. Two histories are of interest. Knaggs (213) publishes the earlier case in which, in addition to general anesthesia, loss of sensation in the conjunctiva was noticed. Dillingham (214) reports a case of intoxication where a temporary ptosis lasting two weeks, formed a principal symptom of the poisoning.

CHRY SOPHANIC ACID. A. Trousseau (215) has recorded a case where alleged eye symptoms followed the application to the skin of a 10 per cent ointment. The inunction produced an acute hyperemia of the conjunctiva that disappeared in a few hours. This, the writer found, differed entirely from the conjunctivitis caused by the direct application of the ointment to the conjunctiva itself, the latter affection persisting for eight days.

SAPONIN. So far as I know there is on record but one case of intoxication from this agent, (a white, inodorous, sweetish-acid, glucoside, derived from *saponaria officinalis*) where a claim of eye symptoms has been set up. These followed the use of the drug upon the person of Fr. Keppler (216) who was at the time experimenting with saponin for the purpose of determining its value as a local anesthetic, and consisted of very severe pains, strabismus and exophthalmus of his left eye.

ESCULUS HIPPOCASTANUM. Horse Chestnut. *Esculin*, a white, bitter, crystalline glucoside, obtained from the bark: dose, 15 grs. in malaria.

Salomon (217) describes the eye symptoms produced in a boy, 3 $\frac{1}{2}$ years of age, from eating the green rind of the fruit. They resemble those of atropia poisoning—widely dilated pupils, staring vision, scarlet face, bounding pulse, etc.

PODOPHYLLUM. Chemists' assistants, who grind certain irritant drugs, are prone to acquire conjunctival hyperemia, as well as acute inflammation and even corneal ulcers, unless the eyes are protected by a mask from the dust. Such is the case with podophyllum, as with many others that it is not within the province of this study to mention. For example, Dr. Cheatham, of Louisville, informs me that in preparing *jequirity* powder, which he uses extensively, he has known the irritating dust set up the most violent and serious inflammation of the anterior portion of the eye, threatening the destruction of the whole organ.

HELLEBOREIN. This alkaloid belongs to a rather large class, of which cocain is the chief representative, the local anesthetics.

Erythrophlacin, (from *E. judiciale*); "*haya poison*," (from *E. guineense*); apomorphin; alpha kava resin (from *piper methysticum*) and "*toad poison*" (27) also produce anesthesia of the cornea and conjunction, but, owing to the pain and inflammation they produce, are not employed in surgery,

HYDROCYANIC ACID AND OTHER CYANIDS. Either the eye signs of poisoning from the cyanids are various and inconstant or else the amblyopia assumed to follow this form of intoxication is partly or wholly due in the three published cases to other causes. The symptoms of each differ from those of the other two and they represent every case I could find in literature. H. de Tatham (218) reports, as the result of exposure to the vapor of dilute hydrocyanic acid, a temporary hemianopia, that disappeared in a few hours. G. F. Souwers (219), in a photographer poisoned by potassic cyanid, remarks swelling of the upper lids and sluggish pupils. Müller-Warneck (220) saw completely dilated pupils, with absent irritation reflex and proptosis, in a case of intoxication from cyanid of potassium; the patient recovered.

SPT. ETHERIS NITROSI. Hill (221), while describing a case of acute poisoning from 3 ounces, in a boy 3 years of age, mentions dilatation and immobility of the pupils. The post mortem examination showed highly congested cerebral veins.

The following list of drugs and poisons receive briefer mention, either because the original article describing the toxic amblyopia in question is not accessible to me, or because the eye symptom or symptoms have a doubtful connection with the intoxication, or because the alleged amblyopia is the only recorded instance of the untoward effect of the agent upon the eye or is the result of physiological experiments upon the lower animals only. I do not doubt, however, that a number of the cases are genuine examples of toxic amblyopia.

Nitroglycerin; ophthalmoplegia as a late symptom, Nieden.¹

Chromic acid; a 5 per cent solution applied as a remedy for perspiring feet has produced temporary *yellow vision*.

Hydracetic; in one eye small retinal hemorrhages, attributed by Grünthal (222) to inunction of salve containing the drug: the urine contained much albumen.

Antifebrin; Simpson² reports contracted and motionless pupils after 105 grains in two and a half hours.

Curare poisoning also produces, as a late ocular symptom, miosis.

Marsh gas, "choke damp," believed by Von Reuss (223) to be the cause of "miners' nystagmus."

Oxalic acid; Koch (224) experiments on rabbits; mydriasis at first, followed by contraction of pupils.

Menthol; Charrin and Rogers' experiments (225) on rabbits ($\frac{5}{7}$ gram. caused death in five to ten minutes) showed post mortem opacities in the lens.

Coniine, from *conium maculatum*; inhalations of solution caused [H. Schulz (226)] lachrymation, burning of conjunctiva and inability to hold the lids open.

Gelsemium sempervirens, according to Ringer, causes contraction of the pupil taken internally, but mydriasis when applied locally.

Cytisin, from *cytisus laburnum*. Albutt records dilated pupils, pallor of the nerve and small retinal vessels.

Crocin; three cases of "black vision" by Bitter (227).

Resorcin; Hirschberg (228), *conjunctivitis* after application of ointment to the face.

Ether petrolei; case reported by Leidy (229) of bilateral mydriasis, motionless pupils and nystagmus followed by recovery.

Nitrous oxide; an additional observation of Bordier (230), a temporary though very marked *miosis* an hour after the extraction of a tooth.

Toluylendiamine; Stadelmann (231), intense yellow discoloration of sclera in animals.

Strychnia poisoning rarely produces eye symptoms, except possibly dilated pupils and engorged retinal vessels during the convulsions.

Sulphur ointment. (vaseline 100. wax 5. sulphur 10): applied for eighteen years, said by Eichbaum (232) to have produced, with other symptoms, an amblyopia of the atropine type.

¹ Quoted by E. Berger, *loco cit.*, p. 408.

² Knies, *loco cit.*, p. 345.

Piscidium; from the extract, *mydriasis*, Seifert (233).

Bromoform; pupils dilated *ad maximum* and unaffected by light, Sachs (234).

Salicyl; Rosenberg (235) reports *exanthema bullosum* affecting the anterior parts of the eye.

Oil of anise; Cadiac and Menuier (236), locally, conjunctivitis and keratitis; internally, lachrymation.

Leucomaines of hydrophobia; Penzoldt (237), severe pains in eye from infection of conjunctiva.

PATHOLOGY AND TREATMENT OF THE MOST IMPORTANT OF THE TOXIC AMBLYOPIAS.

TOBACCO—ALCOHOL. The discovery was made in 1882 by Samelsohn (238), of Cologne, from an examination of the optic nerve of an amblyopic patient and confirmed in the same way by Lawford and Edmunds (239), Nettleship and Edmunds (240), Uthhoff, Sachs (241) and others, that the essential lesion in this disease is an axial interstitial neuritis, beginning somewhere between the papilla and the brain and probably extending thence towards both the center and the periphery. As was suspected by the earlier authorities it is the fibers that supply the macular region (one-fourth or one-third of the whole) that are affected: the others generally escape. Although such a conclusion might with almost perfect certainty be prophesied from the fact that central negative scotomata are nearly always constant factors in the disease, yet the confirmatory evidence of autopsies was needed. From these post-mortem observations (thirteen to the date of writing) we may conclude that the fibers supplying the fovea centralis and surrounding macular region, when they appear at the papilla, form a wedge-shaped sector and lie on the temporal side of the optic disc.¹ After reading the descriptions of the various autopsies referred to, which are given with elaborate preciseness by the various writers, one is forced to the conclusion that the course of the papillo-macular fibers is not an invariable one in every individual. Nor do I think it likely, from what we know of the variations in size of the negative scotomata, that the nervous degeneration is strictly limited to this or that particular bundle supplied to the macular region. In Uthhoff's work, reproductions of the microscopical sections are given showing the relation of the

¹ For example, see Paul Bunge's *Ueber Gesichtsfeld und Faserverlauf im optischen Leitungsapparat*, Halle, 1884, and H. Wilbrand's *Die hemianoptischen Gesichtsfornien und das optische Wahrnehmungscentrum*, Wiesbaden, 1890, both with beautifully colored plates and diagrams.

diseased (papillo-macular) bundles to the healthy nerve fibers in their course from the tractus opticus to the disc. This course corresponds very closely to that found by Uhthoff in a case of absolute central scotoma, the result of tabes dorsalis.

As to the *form of the neuritis* it must be remembered that the axis cylinder and the true nervous elements of the opticus escape; the resulting atrophy of them is a simple and not a numerical one. Indeed, one of the strongest arguments that is urged in favor of an alcoholic origin for many of these cases of central amblyopia is that we find in the optic nerve almost a typical picture of the havoc which alcohol plays in the tissues of other organs, namely, a morbid increase in the connective tissue element of the organ. The trebecular fibers, increasing as to number and size, press upon the true nervous structures and cause their atrophy, just as they effect the atrophy of organic elements elsewhere.

In Stiltzing's case (242) there were marked new vascular and connective tissue formations with abundant increase of nuclei in the interstices. The meshes were diminished in size, a portion of the nerve fibers being atrophic, the nuclei present being closer together than normal, but not numerically hypertrophied.

In much the same way, allowing for differences in structure, are brought about the cirrlosed liver, the fibroid phthisis and the peripheral multiple neuritis of drunkards. If multiple peripheral degenerative neuritis occur in other nerves from alcohol, why not also in the optic nerve? Many instances might be quoted where degenerative changes in peripheral mixed nerves have occurred as a result of chronic alcohol poisoning. Lilienfeld has described a case of alcoholic paralysis of both nervi abducentes and of other peripheral nerves. Hadden found, post mortem, in a very intemperate man, 56 years of age, afflicted with alcoholic paralysis and dead of an intercurrent disease, "most advanced changes in the musculo-cutaneous nerves of the legs, wherein numerous empty and collapsed nerve tubes were seen, the granular material having disappeared."

Oppenheim (244) gives five cases of alcoholic paralysis, but none with affections of vision.

Lancereaux (245) found, post mortem, in a chronic alcoholic female, 48 years of age, with paralysis of the extremities, normal nerve centers, but lesions of the peripheral nerves. These consisted of an advanced granulo-fatty degeneration of the nerve fibers.

One of the most instructive cases yet published, where atrophy of the opticus occurred with peripheral neuritis elsewhere, is recorded by Myles Standish (246). I abstract the history, as follows:

Man, seen by writer in September, 1884, a well marked A.-T. amblyope, 52 years of age. Vision grew slowly worse, until he could barely distinguish people on the street. Finally V. = perception of light, and there was pronounced gray atrophy of the discs. He then passed through all the phases of multiple peripheral neuritis affecting the lower extremities, with pronounced mental symptoms, atrophy of leg muscles, etc. In September, 1886, he had improved so that he could walk up and down stairs. V. = $\frac{1}{10}$, but memory impaired and absent knee jerks. P. of V. nearly normal and no color scotomata. Blue-gray atrophy and small vessels.

Dr. Standish has collected forty-four cases of alcohol, paralysis with reference to the eye symptoms and finds that in seven there were no fundus changes; ten had congested discs; four white discs and two had discs white on the temporal side; three had large pupils that reacted slowly to light, *i. e.*, 43 per cent, at least, had definite eye symptoms. The writer thus ends his interesting article: "the association of a multiple peripheric neuritis, the pathology of which is known, with a toxic amblyopia, the pathology of which is unknown, is particularly interesting and it does not seem improbable that the morbid processes may be identical. In both diseases the tendency of the disease is to recovery if the use of the toxic agent can be prohibited."

Sachs (247), in a recent and exhaustive study of this whole subject, emphasizes the resemblance, first pointed out by Samelsohn, between the ravages produced in the optic nerve by poisons of Class 1, Div. 1, and those changes that mark the cirrhotic liver. "In both diseases," says he, "the process affects the interstitial connective tissue and in both the essential tissues of the organ (nerve fibers and hepatic cells) suffer secondarily from pressure upon them. The analogy may, I think, be carried still farther. The areolar hyperplasia and cellular infiltration, characteristic of interstitial hepatitis, do not bear any constant relation to one another and are not dependent upon one another. In the same way, as shown in the microscopical examination of my patient's optic nerves, the areolar hypertrophy and the cell proliferation appear to be entirely independent of each other, the latter being generally conspicuous by its absence. Nor do I believe that a widespread cellular infiltration could have preceded the connective tissue hypertrophy without showing unmistakable evidence of its

existence, when one recollects that the optic nerve disease lasted until the death of the patient, only a year and a quarter.

The remarkable increase in the number of the neuroglia cells within the diseased bundles is also noticed by Samelsohn. If one accepts the latest theory of the epithelial origin of the neuroglia¹ it would not be improper to compare this process with the commonly observed proliferation of epithelium within the bile ducts. At any rate one effect of this tissue change is to compress and injure the nerve fiber bundles themselves.

The parallel between hepatic cirrhosis and neuritis interstitialis is still more striking when the vascular changes in our case are noted. These frequently occur in the first mentioned affection and consist of endothelial proliferation resulting in thrombotic closure of some vessels, occurring side by side with new vascular formations."

Sachs believes that the process, in his case at least, began not simply in the usual situation (the distal part of the nerve near the chiasma) but as a proliferating endophlebitis of the *vena centralis postica*, occasioning its obliteration and the formation of new capillary blood vessels in its neighborhood.

He thinks, with the English school, that in the mixed cases alcohol merely predisposes to the amblyopia by producing dyspepsia—in the form, usually, of a chronic gastric catarrh—and so interfering not only with the digestion but also with the assimilation of the food. He further believes that the normal gastric juices, undergoing secondary changes of the fatty acid variety, form complex chemical combinations with the nicotine which are either more readily absorbed into the system or are with greater difficulty eliminated from it. The evidence of such abnormal changes occurring in the stomach he finds in the *acetone odor* with which the breath of patients is laden and compares the condition to that of diabetic-tobacco amblyopes whose urine contains butyric acid. In answer to the argument in favor of alcohol as against tobacco (in bringing about the optic neuritis of toxic amblyopia) that while the former is known to produce changes (peripheral neuritis, atrophy, paralysis, etc.) in other portions of the nervous system these effects have never been shown to result from the abuse of tobacco, Sachs adduces the clinical evidence, the rarity of pure alcoholic amblyopia and the fact that the changes in the nervous system set up by alcohol elsewhere are unlike those found in the

¹Edinger. Zwölf Vorlesungen ueber den Bau der Nervösen Central-organe, 1892, p. 31.

optic nerve in the mixed cases. When the ocular apparatus is affected in pure alcoholics the *eye muscles*, *i. e.*, their nerve supply, and not the optic nerve are most likely to suffer.

Horner (248) goes still further. He is convinced that neither alcohol nor tobacco, *as such*, produces the pathological changes in the opticus. They act by inducing gastric catarrh and so interfere with the general nutrition as to bring about such alterations in the nerve that follow certain cases of anemia, chronic discharges, etc. However, the rarity of retrobulbar neuritis in chronic dyspepsia not associated with alcohol, as well as its infrequency in cancer, tuberculosis and similar affections form a strong argument against Horner's extreme views.

The pathology of the central (red, green—sometimes blue and white) scotomata in *diabetic* smokers and drinkers is not clearly defined. That these defects occur in the diabetes of strictly temperate patients is undoubted and the fact seems to confirm Horner's views of the causation of A.-T. amblyopia generally, since the impression remains that the central defects flow from the malnutrition attendant upon the glycosuria rather than upon a special intoxicant. This may be said with some degree of certainty: *When the central field for blue or white is affected the neuritis is of glycosuric origin* and the prognosis is grave, *i. e.*, the case usually goes on to simple atrophy. W. O. Moore's excellent paper (249) on this subject is of great interest.

On the other hand, and in view of the fact that tobacco does not produce visible organic changes in nerves elsewhere,¹ it is thought by some that the orbital neuritis of toxic amblyopia can not be due to nicotine. Hirschberg believes, at any rate, that tobacco may so affect the smaller retinal vessels supplying the macula as to produce an ischemia of that region. Berry also denies the theory of a retro-bulbar neuritis, believing that the poisonous effects of tobacco are expended on the cerebral origin of the papillo-macular fibers and postulates a common center for these in the brain. As an opportunity for an examination of the whole course of the optic nerve in toxic amblyopia rarely occurs, and since not more than two cases of pure tobacco or alcoholic amblyopia have thus far been examined, one cannot state posi-

¹A few observers claim that it does. In an article contributed to the *Recueil d'ophtalmologie*, 1885, page 98, Jan records a case of unilateral paresis of the third nerve in a man 42 years of age, otherwise healthy, but addicted to the inordinate use of tobacco. The author argues that this can only be an instance of peripheral nicotine neuritis.

tively in what respect, if any, the lesions in the "pure" cases differ from the mixed cases referred to, or how they differ from one another. *A priori* reasoning would lead us to believe that the organic changes are practically the same in all cases of toxic amblyopia of which relative scotomata form a prominent symptom. But this certainly needs confirmation, not only in respect of tobacco and alcohol alone, but in the amblyopia due to *carbon bisulphide, cannabis indica* and *iodoform*.

Sachs calls the fibers that first undergo degenerative changes and from which these spread to surrounding parts the "nuclear group" ("*kern-gruppe*") as it is here that the most destructive and best marked alterations are almost always to be found. These proceed until the papillo-macular bundles are affected; but the morbid process does not reach such a high degree in the latter, and thus it is easy to understand why an absolute defect is never found centrally and why the disease in this region is usually reparable. The alterations do not affect the nerve fibers themselves but merely the areolar septa, in the form of hyperemia and edema, so that the *true nervous tissue enclosed by the former are merely temporarily injured*. Thus the curability of a recent amblyopia may be looked for with certainty.

Regarding the anatomical explanation of that important ophthalmoscopic sign in tobacco-alcohol amblyopia, decoloration of the temporal half of the papilla, I quote further from Sachs (*q. v.*): "the physical explanation of this condition has not hitherto been sufficiently dwelt upon. Gowers considers it as due to a disappearance (atrophy) of the capillary vessels and a reduction of the red element in the normal color of the disc.

"Of more importance and easier of demonstration is the influence of the atrophy on the coloration of the papilla. The contraction of the areolar spaces of the lamina cribrosa and the marked aggregation of their trabeculae, in consequence of a diminution in size of the nerve bundles that pass between them, must increase the quantity of light reflected from the anterior surface of the lamina itself. Moreover the thinning of the *overlying* nervous layer contributes largely to the same result. This phenomenon is really a 'contrast' effect, the remaining area of the papilla being either of the normal reddish color or made still redder by a hyperemic condition often present.

"The histological changes seen in sections of the nerve trunk, on both sides of the point of entrance of the retinal vessels, differ from those found in the latter region in that in the former the

hypertrophied connective tissue is unaccompanied by cell proliferation, while at the vascular entrance the alterations present inflammatory changes within some of the bundles and about some of the vessels."

The correspondence of the temporal triangular wedge to the papillo-macular bundles of fibers is beautifully confirmed in a case reported by Knapp (250) where, in an absolutely temperate girl, 18 years of age, a *coloboma of the macula lutea*, with the usual opticus sector plainly atrophied, was discovered by the ophthalmoscope.

PROPHYLAXIS AND HYGIENE.

It is proper here to say a few words about prophylactic treatment, although the precautionary measures desirable in the case of persons exposed to the deleterious action of the toxic agents we have been considering, will appeal to the common sense of every medical man.

It need hardly be urged that a well informed practitioner should remember how large a number of the commoner drugs which he is called upon to use in daily practice, may, in some patients and under certain conditions, be hurtful to the eye, or may interfere with its function, and that he should not neglect these danger signals of disease when they display themselves and so diminish the dose or entirely stop the remedy.

Other precautions suggest themselves. It has been noticed, for instance, that most cases of carbon disulphid amblyopia occur during those seasons of the year when windows and doors are shut and ventilation is imperfect. It is imperative, therefore, that in rubber or other factories, where this agent is employed, the strictest attention should always be given to devices for carrying off the volatile fumes and for their dilution with an abundant supply of fresh air.

One of Delpsch's patients (251) designed the following apparatus for avoiding inhalation of carbon disulphid fumes: "In a chamber which can be freely ventilated through its two extremities, a horizontal board is fixed to the sides by its two ends; from its anterior edge a board descends to the floor of the chamber; from its posterior rises a vertical plank, fourteen inches high; this is pierced by three pairs of apertures so arranged as conveniently to give passage to the hands and forearms of three workmen. From the upper border of this vertical plank a sheet of glass passes upwards and forward, and allows the

workers to see their hands. The closure of the chamber is completed anteriorly, so that the only communication between it and the remainder of the room is through the six circular apertures. These are protected by impermeable and supple india rubber, which fits closely to the wrists of the workers by means of bracelets. The workmen sit with their legs beneath the horizontal table. All the operations are carried on within the chamber. It is stated that no odor was perceptible, and that although the operations were slightly retarded they were not so to any inconvenient extent."

Workers in *white lead* manufactories should be especially careful to keep their hands and finger nails clean and free from the poison, and when engaged in dry mixing should wear respirators. According to Berger, in the large lead works of Ivry, near Paris, ideally conducted from a hygienic standpoint, the workmen never suffer from symptoms of saturnism.

Under the heading "Prevention of Industrial Lead Poisoning," the *British Medical Journal* (II, 1893, page 1345) has the following:

The Departmental Committee, appointed by Mr. Asquith to inquire into the white lead and allied industries, and to suggest any precautions necessary for the protection of life and health, has presented its report. The greatest change recommended is the exclusion of females from all direct contact with white lead. In some works this is already done, and it is believed that the total number of women who would be displaced if this recommendation was carried out would not exceed 600. Further, they recommend that no female under 20 should be employed in white lead works; that before employment women¹ should be submitted to medical examination, and that in both sexes a medical certificate should be required after absence through illness before return to work. They recommend that women should be required to wear overalls and head-coverings, and special shoes and stockings, while engaged in certain parts of the works. With regard to the enameling of iron plates, the recommendations are very similar; and it is proposed that in color works, also, the employment of females and male "young persons" should be prohibited, and that in lead smelting these two classes should not be permitted to clean the flues; further, that nobody should be allowed to work in the flues for more than two hours at a time, nor leave afterwards before taking a bath. The provision of special lavatory accommodation is advised in color works, lead smelting, yellow lead, electric accumulator, turning and enamelling of iron hollow ware, and red and orange lead works, and in the last it is recommended that all persons employed should be submitted to a weekly medical

¹T. Oliver (Gulstonian Lectures, 1891, I.) found that women exhibit a greater susceptibility to lead poison than men. Of 135 cases noted by him in the Newcastle Infirmary 91 were women and 44 men. C. A. W.

inspection. In the case of white lead and the enamelling of iron plates and hollow ware, the provision of a dining room is recommended. The report contains a large number of proposed regulations directed to prevent poisoning through dust or by want of personal cleanliness, specially adapted to the needs of each industry, and it is proposed that the usage which obtains in the case of accidents—a compulsory report to her Majesty's Inspector of Factories and the certifying surgeon of the district—should be extended to cases of lead poisoning.

If in popular works on personal hygiene, as well as in lectures and essays prepared by members of the profession for the guidance and enlightenment of the laity, certain facts connected with the loss of vision sometimes produced by indulgence in tobacco and alcohol were set forth (without the exaggeration which sometimes characterizes the statements of prohibition and teetotal enthusiasts) it would at least serve as a warning to smokers and drinkers to cease or to moderate the, to them, abuse of these stimulants. The medical man should warn patients (those over thirty years of age particularly), with dyspepsia or other diseases affecting nutrition, that their smoking and drinking are very likely to lead to loss of vision through disease of the optic nerve.

The assertion frequently made by me, that obscure ocular symptoms or a transient amblyopia often accompany the medicinal employment of our common drugs—quinin, salicylic acid, iodoform, cannabis indica, etc.—and the daily use of tobacco, alcohol, tea, coffee and chocolate, is worth bearing in mind as explanatory of occasional attacks of weakened sight.

It is not intended to discuss, except very generally, the treatment of those concomitant troubles which so often afflict toxic amblyopes unless they have a direct bearing upon the visual failure. It need hardly be said that all the toxic symptoms should be treated together.

Whatever be the form of poison that has caused the amblyopia, it should at once be discontinued. To this general rule there are, however, some exceptions. When the physician discovers that his patient does not entirely abstain from the deleterious agent he must be content with regulating its amount and time of indulgence; and he will often better accomplish this by allowing him to take a definite quantity than by attempting to force him to go without it altogether. Hutchinson and others do not restrict the amblyope in the matter of beer or wine, if taken in moderation, but sternly forbid the use of all forms of tobacco. On the other hand, Minor finds his patients make excellent progress toward recovery when no embargo is laid upon their smoking or chewing. The obser-

vation that total abstinence is not a necessary factor in treatment has been made by many observers. Hill Griffiths, for example, as well as Lawford and Nettleship refer to it. Still, one can not help believing that in such cases the patient *recovers in spite of the poison and not in consequence of it*, and so convinced am I, from observation of the behavior of patients treated with and without a continuance of the intoxicant, that a quicker cure is reached in cases of entire abstinence that I consider it desirable to impress the patient with the idea that the length of time necessary for a cure will to a large degree depend upon the extent to which he indulges in his old habits. If, however, it is considered desirable to allow the patient to continue his tobacco or alcohol or both, he should be given moderate quantities of beer or light wine, taken only after meals, and he should smoke (not chew) a small quantity of mild tobacco, or one cigar, daily, and always after eating.

Next to abstinence from the evident cause of the disease is the recovery of the systemic tone which is nearly always lost in toxic amblyopia of the first class. So far as possible a return should be made to a normal condition of health. The regulation of the bowels, attention to kind of food, care in personal habits, etc., are of great importance. *The digestive power is frequently weak and should be fortified by appropriate means.* Gastric catarrh or other form of dyspepsia is almost always present. Bitter infusions and tonics are nearly always of value, indeed, it is probable that, to the tonic effects of certain specifics used in this disease, most of their value is due. Out-door exercise will be useful to those of sedentary occupations. The use of Turkish baths has been highly recommended, and in alcoholic cases especially has a decided value. In these various ways a much needed supply of good blood is carried to the badly nourished optic nerve tissue.

Coming to the so-called specific remedies, preparations of *nuxvomica*, *strychnia* particularly, are very useful, especially in pallor of the disc and when general toxic (nervous) symptoms are present. Decidedly the most effective method of exhibiting strychnia is by hypodermic injection, beginning with a small dose, say gr. $\frac{1}{30}$ once daily, and gradually increasing it until dryness of the mouth, stiffness of the muscles of the jaw and jerking of the extremities are produced. My practice is to order a fresh one per cent solution (for easy determination of the dose) of the sulphat or nitrate, and, using the same medicine dropper to insure uniformity in the size of the drops, inject the solution once a day, gradually increasing the dose by one or two drops until no further

increase is tolerated. I then diminish the dose one drop ($\frac{1}{100}$ gr.) daily until no reaction is produced, and thenceforth continue that quantity. In conjunction with the injection I prescribe tonic doses of tinct. nucis vom. or liq. strychnia, combined or not with iron or quinin, before meals.

Iodid of potassium is another useful remedy and to be given, like strychnia, in gradually increasing doses. When there is hyperemia of the disc or signs of odema this drug is to be preferred to nux vomica preparations.

On account of the temporary improvement induced by inhalations of *amyl nitrite*, that drug has been recommended by several observers. Deutschmann especially, but although I have frequently tried it, I do not believe that it produces any permanently useful effects.

Coursserant (252), de Wecker and others advise hypodermic injections of pilocarpin in tobacco-alcohol amblyopia.

The tonic effects of electricity should not be forgotten, and I believe its use is attended with benefit in almost all cases of central amblyopia, although I know very little of its *modus operandi*. The interrupted galvanic current, in doses of from one to five milliamperes should be employed, the negative electrode to the eye and the positive to the nape of the neck, for a few minutes daily.

Potassic bromid was employed twenty years ago in the treatment of the amblyopia from alcohol, probably on account of its beneficial effect in other manifestations of alcoholism. See, for example, the papers of Bull (253), and L. Turnbull (254), the latter claiming priority over Quaglino (255) in the use of this remedy. The Italian ophthalmologist not only shows that he had used the bromid several months before Turnbull, but credits MacNamara and Galezowski with its recommendation at a still earlier date. He prescribed it in doses of 1 grm. to be gradually increased until as much as 8, 10 or 12 grms. daily are taken. The Italian medical journals from 1871 to 1880, and even later, contain enthusiastic references to the value of potassium bromid in amblyopia ex abusu. The papers of Fumigalli (256) and Simi (257) are of especial interest.

Quinia sulphat has also had its advocates, but it is not likely that it has a specific action, but produces its good effect indirectly, as a general tonic. Ponti (258) employed it in 1873 and claimed for it special advantages.

I have already spoken of the use of hypodermic injections of

pilocarpin in alcohol-tobacco amblyopia. Coursserant asserts that immediate relief (*vide ante*) is given, that the cure is rapid and in every way satisfactory. He considers it especially valuable for poor people, who need their eyesight sooner than their more affluent neighbors! He presents a list of twenty-three cases, all treated by this means, with the addition of abstinence, tonics, the use of tinted glasses and, sometimes, hydrotherapy. He claims that cures were made in from nine to forty-five days.

I have myself had some experience with *pilocarpin* injections in such instances and think highly of them. I believe that where one can have his patient under proper control, especially in a hospital, these injections, given daily, beginning with $\frac{1}{8}$ gr. and increasing the dose if necessary to produce marked salivation, are of signal advantage and do cut short the time of treatment. Of course the dose, the interval between the sub-cutaneous medications, as well as other details of treatment, must be varied to suit the individual case. As a rule I give them early in the morning with the following remedial adjuncts: the patient does not rise for breakfast, but takes instead of that meal copious drinks of hot and weak lemonade *after* the injection. He is then wrapped in blankets, with hot bottles to his feet and allowed to sweat thoroughly for half an hour. The hot bottles and all but one blanket are now removed for another half hour. Then he is rubbed down, allowed to dress and takes a light breakfast. In the afternoon, after lunch, he may go about as usual. I would strongly advise those who have not tried this plan to make the experiment in suitable cases.

ARSENIC. According to Osler (259) peripheral multiple neuritis is occasionally a result of arsenical poisoning, the symptoms of which closely resemble those due to chronic alcoholism. The remarks made regarding the relation of these nerve changes in the case of alcohol probably also apply to the nervous lesions produced by arsenic. Having them in view one may regard the retinitis and its attendant vitreous disease, seen in Hutchinson's case (49), as an arsenical neuritis of the peripheral variety. Probably, also, the nystagmus observed by Krehl (123) was due to the same cause—a neuritis of the external ocular muscle supply—that Uhthoff assigned to this symptom in his case of alcohol amblyopia.

Aside from Liebrecht's case (50), Dana (121) and H. Derby (122) have abundantly proved the production of optic neuritis by this poison. The former thus concludes his elaborate researches: "1. A disease resembling tabes may be caused by arsenic taken

medicinally or otherwise. 2. The arsenical paralyses are due to a multiple neuritis. 3. Arsenical paralyses, like those of diphtheria, alcohol and lead, are of two types, (*a*) the ordinary mixed motor and sensory paralyses, and (*b*) the pseudo-tabetic form." In other words the optic neuritis due to arsenic is (or may be) part of a multiple neuritis or it may take on the retro-bulbar form or present the usual picture of an optic neuritis.

CARBON DISULPHID. Where this agent is employed in conjunction with the *chlorid of sulphur* in vulcanizing, it is the former that occasions the retro-bulbar and simple optic neuritis, which are the characteristic ocular lesions of the intoxication. Decided changes are found at the papillary region. In the earlier stages these are haziness of the disc and other signs of a chronic papillitis, but later on pallor and atrophy appear. Central defects in the visual field are almost always found when sought for at the onset of the ocular symptoms. Indeed we may regard the early changes as almost invariably those of a retro-bulbar neuritis gradually deepening into a true simple atrophy, unless the patient is removed from the malign influence of the poison and promptly treated.

Becker (260) remarks that the oval scotomata in his case lay more above than below, as in alcohol-tobacco amblyopia, and believes the whole process to be probably a retro-bulbar neuritis affecting the macular fibers, the color sense being more disturbed than the form sense.

Treatment. Improvement begins as soon as the patient is removed from the influence of the poison. Many of the cases included in the report of the committee appointed by the Ophthalmological Society of the United Kingdom were treated by phosphorus. Recovery from most of the symptoms—the anaphrodisia and weakness of the legs being very intractable—occurred after several months. Hirschberg (261) treated his two patients with potassic iodid combined with a course of sweating. Becker gave the iodid with iron, and, later, *ext. nucis vom.* internally, followed by strychnia injections. Lavigerie (262) claims good results from the use of potassic iodid and strychnia. Gallemaerts' (115) case—a well marked example of retro-bulbar neuritis—was treated with quinin and strychnia and improved greatly.

COCAIN. The acute cases call for powerful stimulants, especially amyl nitrite inhalations, ether injections and electricity.

Golowkow (263) reports the following case:

A patient, for toothache, was given two hypodermic injections (a Pravaz syringe-ful each time) of a two per cent solution of cocain muriat at an interval of ninety minutes. Five minutes afterwards there was noticed dilatation of pupil, extreme pallor, small pulse, rigors, and great difficulty of breathing. In ten minutes the pulse was 200 and dicrotic, respirations 60, pains in back and cardiac region, fear of death, convulsions of extremities. Inhalations of strong *liquor ammoniac* and its internal administration (4 to 5 drops every five minutes) caused in half an hour a decided diminution of the symptoms.

ERGOT. The permanent cataract as well as the temporary amblyopia are both probably due to the cutting off of the nutrient supply to the retinal vessels, to the optic nerve, and to the ciliary vessels supplying the lens. Knies thinks that the general convulsive seizures of ergotism may have something to do with the production of raphanic cataract just as it is probably the cause of lamellar cataract in rachitic children. This is also the opinion of Talko, who does not think it due to the action of the ergot. Meier (143) also believes that the ergotism acts through the medium of the ciliary nerves and that these in their turn bring about a contraction of the vessels, shutting off the nutritive supply to the lens.

IODOFORM. This is unquestionably a drug that like tobacco and alcohol produces a retro-bulbar neuritis, and although no autopsy was made in any of the cases reported, all the symptoms point to changes in the nerve closely resembling those found in other members of the same group. Priestly Smith gave his patient at first hypodermic injections of strychnia and, later on, the same remedy, combined with iron, by the mouth. Hutchinson's case was treated with hypodermic injections of strychnia (gr. $\frac{1}{10}$) daily. In a fourth case reported by Valude (264) the symptoms were such as might have followed the suppuration, diarrhea and hectic fever, that are sometimes set up by extensive burns. The patient was a boy, 12 years of age; the burn extended over the lower part of the right side of his body, and was at first treated with iodoform, and shortly afterward the patient became totally blind. Eleven months subsequently to that, V., R. = fingers at 10 cm.; V., L. = fingers at 20 cm. The discs became white and atrophic, color perception was lost, but the retinal vessels were not contracted.

LEAD. Unfortunately there are very few autopsies recorded. In Atkinson's case no changes in the ocular apparatus are mentioned. The various manifestations of lead amblyopia probably correspond with very different morbid alterations in the tissues of the eye. In

the mild forms, where there are no ophthalmoscopic appearances, one can but guess at the probable organic lesion. Gowers (265) thinks that the transient amblyopia is caused by the effect of lead on the nerve centers, as in uremia and diabetes. Gunsberg (129) who publishes a case of transitory amblyopia due to lead poisoning, would class it among the uremiæ. He considers that the kidney affection is caused by the plumbism, which in its turn brings about a temporary disturbance of vision. Weber (266) thinks that the amaurosis is not due to kidney disease, but is a brain symptom. He explains the temporary amblyopia by regarding it as the result of arterial spasm and the over filling of the veins—such a condition as is present in an attack of lead colic. These symptoms occur in a person but a short time exposed to the poison.

Long-standing cases of white atrophy, as well as those that show acute inflammatory neuritis (papillitis) with retinal hemorrhages are the result of nervous irritation set up by the circulation of lead salts in the system. So far as we know, the histological changes are those that accompany these diseases when due to other causes, such as diabetes, albuminuria and brain tumors. As we may have retinitis when no kidney disease is present, and optic atrophy without decided spinal or cerebral symptoms, it is not proper to regard the latter as only indirectly dependent upon the circulation of plumbic salts in the system. When two or more possible causes of the ocular affections co-exist in the same patient, their pathology is to that extent obscured. The local appearances of most examples of albuminuric and diabetic retinitis are, however, so pathognomonic and so different from the inflammatory fundus-changes seen in lead amblyopia that the question of causation does not often arise. The possible coincidence of brain tumor with lead amaurosis must also be borne in mind.

As the actual method of causation of any of these morbid states is still *sub judice*, it is idle to speculate about their origin in the comparatively rare instances furnished by lead poisoning.

Parisotti and Molotti (267) observed a case of optic nerve atrophy which after careful examination by the ophthalmoscope, they concluded was the result of an *endarteritis saturnina obliterans*. The ocular muscular pareses are undoubtedly the result (as in the paralysis of the forearm extensors) of a peripheral neuritis. The third nerve is affected in precisely the same way, although not so frequently, as the muscular branches of the musculo-spiral and posterior interosseous.

Many theories have been advanced respecting the essential structural changes in the various manifestations of chronic lead poisoning. Whatever secondary alterations may occur it is probable that the process *begins* (Oeller, Kussmaul, Meyer) in the terminal vessels as a fatty metamorphosis or arterio-sclerosis (obliterating peri or endarteritis). Later on, the nervous, muscular and other tissues supplied by these nutrient vessels may be converted into fat, fibrous tissue or the hyaline substance. As before mentioned, these changes, when they occur in the retina, may, during life, be studied ophthalmoscopically.

The following five cases reported by Landesberg (125) will serve to show the results of *treatment* in cases of lead amblyopia.

Case 1. Patient 40 years of age; worked fifteen years in plumber's shop. Had several times suffered from general attacks of lead poisoning. Atrophy of both papillæ. V., R. = $\frac{10}{200}$; V., L. = fingers at four feet. The treatment consisted of warm baths and hypodermic injections of strychnia, after which V., R. = $\frac{10}{100}$; L. unchanged.

Case 2. Lead worker 21 years of age, who handled chiefly lead oxide, besides general symptoms had paralysis of the rectus externus on R. side. Complete recovery.

Case 3. Lead worker, 34 years of age, had several attacks of general lead symptoms. R. E., complete paralysis of all branches of the oculo-motorius. Pupil slightly contracted and the accommodation normal. K. I. and diaphoretic treatment did no good, but strychnia subcutaneously brought about a complete cure.

Case 4. Lead worker, 39 years of age, had central atrophic excavation of both papillæ with great narrowing of the arteries; also commencing ataxia and interference with audition. V., R. = $\frac{20}{200}$; V., L. = $\frac{10}{200}$. Treatment did no good.

Case 5. Painter, 23 years of age, who had shortly before suffered from lead intoxication. Neuritis optica, both sides. V., R. = $\frac{20}{40}$; V., L. = $\frac{20}{40}$. K. I. with pilocarpin *sub cutem* brought about complete recovery and good vision.

Breuer (268) advises local blood letting, the artificial leech to the temples once a week, with subcutaneous injections of morphia into the temporal region.

QUININ. According to Knapp (91) the clinical features are pallor of the disc, marked diminution of retinal vessels in number and caliber, and contraction of the visual field. Buller (93) thought these symptoms to be the result of an effusion into the lymph spaces around the nerves, too transient to cause papil-

litis, but sufficient to produce edema and blanching of the retina, and to reduce the blood-carrying capacity of the central arteries. E. A. Browne (92) thinks that the nutrient fluids of the body, becoming charged with quinin (and acting through the vasomotor system) cause a contraction of the peripheral vessels and prevent the entrance of blood into the retinal arteries and veins.

Brunner (269) (and Horner) made experiments on dogs under the influence of large doses of quinin, and concludes that the disease is essentially a retinal ischemia. Ulrich (270) confirmed this finding in 1887. In the hope of being able to throw some further light upon this subject, de Schweinitz (90) produced quinin blindness in dogs by hypodermic injections—one to four grains to the pound. Ophthalmoscopic appearances before the death of the animals were much the same as that found in the human subject. Blindness was produced in from three to fourteen hours and lasted from thirty-six hours to twenty-nine days. The eyes were hardened in Mueller's fluid, cut in paraffine and stained with borax-carmin and indigo-carmin. Wiegert's staining was used for the detection of nerve changes. No gross lesion was found except in one case. Here there was decided dilatation of the blood vessels, the central vein was plugged with a clot and white thrombi filled the smaller veins. There were no alterations in the retina, and Wiegert's stain showed no nervous lesion. In every corneal section there was remarkable dilatation of the perivascular lymph spaces with degeneration of the cellular protoplasm. On the whole, de Schweinitz believes that while his experiments do not prove or disprove any of the hypotheses hitherto advanced, those who place the lesion in the optic nerve chiasma and eye-ball come nearest the truth, and that there is present in quinin amaurosis a species of temporary edema. That retinal thrombosis is not present in the human species is evidenced by the more or less rapid recovery from the disease.

The author made a second series of experiments (271) the result of which he reported to the twenty-seventh meeting of the American Ophthalmological Society. He found that the changes previously discovered can be produced by all of the various salts of quinin, and that prolongation of the quinin blindness results in a true optic atrophy sometimes associated with the production of thrombosis or embolism in the central retinal vessels. In sections made from a dog, kept completely blind for two months, the microscope showed cupping of the optic nerve entrance, complete atrophy of the optic nerve, chiasm and tracts, an organized

thrombus in the central vessels, and some degeneration of the lenticular ganglion. A very remarkable fact is the selection of the optic nerve for the influence of quinin, as careful sections of the ciliary and other cranial nerves showed absolutely normal structure.

The change in the pericellular lymph spaces, which had been found in the first research, was shown to be unconnected with any action of quinin, being purely an accidental occurrence, perhaps due to some fault in the technique. The conclusion from these experiments are: that the action of poisonous doses of quinin is undoubtedly originally due to a constriction of the peripheral vessels; that later, distinct changes, either in the blood itself or in the blood vessels, are originated, and that consequent thrombosis may occur, followed by complete atrophy and fatty degeneration of a large portion of the visual tract. These conclusions are in accord with those of Barabasheff (272) based on observation of the clinical symptoms produced by very large doses of quinin in human adults.¹

The *treatment* of quinin amaurosis is much the same as that of tobacco amblyopia, but it, of course, must vary in accordance with the character of the fundus changes and is very unsatisfactory. Kaspar Pischl's case (273 and 101) (where the usual symptoms were present and the F. of V. for white was narrowed to three degrees) recovered under strychnia injected hypodermically so that the perimeter measurements for white were almost normal; field for colors somewhat restricted; discs still pale and vessels narrowed. Webster Fox (274) successfully treated his case—a boy, 13 years of age, whose vision after three months use of quinin, sank suddenly to $\frac{20}{200}$ —with hydrobromic acid administered internally. In Peña's (275) report a 7-year old scrofulous boy had an ophthalmoplegia, loss of vision and the usual fundus changes from quinin. The treatment consisted at first, of cod liver oil, tonics and hypodermic injections of strychnia nitrate, followed, later, by the constant electric current. R. C. Prewitt (276) had a patient, boy, 5 years of

¹A few months ago Dr. de Schweinitz wrote me, in answer to an inquiry, as follows: "I have not done anything very special in regard to the toxic amblyopias recently, but am gathering together some of my work on this topic for publication. I regret to say that my recent experiments in alcohol have been entirely negative, as I think I told you those in tobacco were, but neither of them was carried on to any great length. Those in Filix mas also turned out negatively, at least as far as I have gone. I have not examined all of my specimens as yet, and have hopes that perhaps some may show lesions."

age, who on the second day after taking four grains of quinin every two to four hours became perfectly blind. The drug was stopped, ergot and potassic bromid were administered and in a few days sight was restored. Berger (*loco cit.* p. 410) considers laudanum *plus* alcohol in large doses, an antidote to quinin, and in a case reported by him (a woman, 22 years of age, blind and deaf after a single dose of 150 grains) gave these remedies, followed by strychnia hypodermically, with some improvement, although, as in a majority of such instances, the limited field and marked fundus changes persisted. Claiborne (277) has also lately added his (similar) experience of the treatment of quinin amaurosis.

Dr. de Gouvea, of Rio Janeiro, at the last meeting of the International Medical Congress, related an interesting case of quinin amaurosis (278), which he said was quite common in Brazil:

A strong farmer, 30 years of age, took 20 grms. of quinin sulphate with suicidal intent, and in spite of an emetic immediately administered, lost consciousness. On recovery he was blind and deaf. Eight months afterwards he had doubtful perception of light in both eyes, snow white papillæ and barely visible retinal vessels. Hearing improved. He was given amyl nitrite inhalations, cold douches, followed by rough towelling, and later strychnia injections in the temples. After a treatment for a month by these methods without result he was sent away with advice to continue the cold water cure. Eight months later he returned with V. of I in one eye and $\frac{2}{3}$ in the other. The visual fields are concentrically contracted; there are no marked changes in the papillæ and the retinal vessels are somewhat more visible. Tinnitus still present.

SALICYLIC ACID AND SODIC SALICYLATE. Knapp (135) states that in three cases the visual disturbances after these drugs are about the same as in less severe attacks of quinin amaurosis and leave behind them no noticeable traces. The results of de Schweinitz's experiments on dogs (90) where large doses were given were entirely negative. He failed to discover anything that might lead one to suppose that the character of the lesions resembles those of quinin.

Some additional clinical evidence in favor of Knapp's suggestion regarding a similarity between the tissue alterations in the amaurosis of the salicylates and the milder forms of quinin amblyopia is furnished by such cases as Rogers' (Vol. III, p. 81 of these ANNALS) and the following experience of my own:

Dr. F., 23 years of age, consulted me August 13 last. His eyesight had had always been good until ten days before, when he found himself suddenly unable to read. This got worse during the following two or three days until he noticed failure of distant vision also and that his pupils

were widely dilated. He had not been taking mydriatics internally, had not used eye drops or any application to the eyes. No sore throat for months. For rheumatism, attacks of which he has occasionally, he has been in the habit of using powders of sodic salicylate. Lately he had taken in all nine or ten gramme doses, and after the last dose became quite deaf, with vertigo, buzzing noises in the ears and throbbing in the head. Last of all the ocular signs appeared. The tinnitis and other aural symptoms left, but the eye difficulties persisted. On the first day that I saw him, ten days after the eye symptoms set in, V., R. = $\frac{8}{15}$ and J. VI at 30 cm.; V., L. = $\frac{9}{10}$ and J. VIII at 30 cm. Pupils dilated, but respond sluggishly to bright light and to efforts at accommodation. With + 2 D. left, and + 1.75 right, patient can read J. I at 30 cm. There were no visible fundus changes. Under $\frac{1}{10}\%$ eserine ointment, patient slowly recovered normal vision for both distant and near work.

PTOMAINES. One of the active agents in fish poisoning, and, indeed, in several other forms of decomposed food that produced *mydriasis*, was found by Brieger to be *ethylenediamine*. It is a strongly alkaline base, readily forming neutral salts with acids.

Treatment is practically the same as for atropine amblyopia.

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[THE END]

ACOUSTIC NEURASTHENIA.

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NEURASTHENIA may be defined as a played-out state of the nervous system and acoustic neurasthenia as one manifestation implicating the acoustic nerve. Acoustic neurasthenia marks the first approach of this insidious symptom-complex upon the domain of the special senses. Either one or both ears may be involved. Patients so affected complain principally of a hardness of hearing, varying from the more common disorder of mere slowness of hearing to so great an impairment that the whisper is heard only close to the diseased ear. In the former, the sounds are heard but because of acoustic lassitude are not quickly combined, and the patients will often answer a question some moments after all hope of a response has disappeared. One is apt to become impatient with them, there is such an apparent dullness of cerebration. How far this is due to cerebral and how far to acoustic inertia, the writer is not prepared to state. This slowness or hardness of hearing has existed for an interval varying from a few days to as many years, according to the duration of the causative conditions and the individual resistance. Tinnitus may or may not be present, nearly as often the one as the other, and when present may be either occasional or constant, the latter being regarded as especially tantalizing, so much so, indeed, as often to be the main grievance. Pain is an occasional symptom, and is either of the sharp and shooting, or of the dull, aching variety, and is never constant. Paresthesiæ are apt to be very common, and are complained of more at certain times than at others. The membrana tympani and tympanum may be normal or may show signs of any pre-existing or existing diseased condition, for it is true of neurasthenia that it explodes in a part already weakened by pathological processes, and, like cerumen, often coexists in the ear with other aural trouble. It is tempting to write down a case, cerumen, and dismiss it from one's memory, but it is not truthful, and so it is with neurasthenia. The rhino-pharyngeal tract may be normal, atrophic or hypertrophic and its processes seem to have no especial bearing upon the progress of the disease.

The general health is in some cases surprisingly good, the muscular system well developed and the other special senses well preserved. Still, in the majority of neurasthenics, the stomacic and intestinal digestions are prone to derangement, though it is not rare to find the bowels regular and the digestion good, especially among the more youthful patients. Many are delicate and ill-kept. They are usually of a nervous temperament, which in the more serious cases becomes hysterical.

In testing the hearing and in making the diagnosis, the tuning-forks and Galton whistle render valuable aid. A few typical cases are appended, with their tuning-fork reactions, by way of illustration. A *schema* showing the normal reactions is first given, the numerals representing the duration of perception in seconds, the Rinné showing whether the respective forks are heard louder by A C or B C (air conduction or bone conduction) at the initial point.

Rinné	A C	A C	A C	A C	A C	
Schwabach.. {	A C.....	24 $\frac{2}{3}$	14 $\frac{2}{3}$	33	31 $\frac{2}{3}$	22
	B C.....	13	7 $\frac{1}{3}$	12 $\frac{2}{3}$	13 $\frac{1}{3}$	14
T.-F.	C 128 v. s.	C ¹ 256 v. s.	C ² 512 v. s.	C ³ 1,024 v. s.	C ⁴ 2,048 v. s.	

Case I. E. D., 18 years of age, general health poor, troubled with acne, rather dull and sullen, masturbates three or more times daily; complains of deafness lasting six months, with constant tinnitus; good appetite, sleeps well; membrana tympani moderately succulent and retracted, light reflex shortened; naso-pharynx normal; watch heard 1 P., whisper zero, speech 1 ft. Tuning-forks as follows:

Rinné.....	A C	A C	A C	A C	A C	A C
Schwabach....	$\left\{ \begin{array}{l} \text{A C} \dots\dots\dots 6 \\ \text{B C} \dots\dots\dots 4 \end{array} \right.$	$\left\{ \begin{array}{l} 9 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} 5 \\ 4 \end{array} \right.$	$\left\{ \begin{array}{l} 7 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} 8 \\ 4 \end{array} \right.$	$\left\{ \begin{array}{l} 5 \\ 8 \end{array} \right.$
T.-F.	C ⁻¹	C	C ¹	C ²	C ³	C ⁴

Case II. J. A. D., 21 years of age, complains of slowness of hearing; membrana tympani about normal; no tinnitus; an athlete with a worrying

business; extremely good physique and health, but nervous; watch heard 30", whisper 22 ft., Galton whistle $\frac{9}{10}$, Weber =. Tuning-fork average for both ears:

Rinné.....	A C	A C	A C	A C	A C	A C	
Schwabach....	$\left\{ \begin{array}{l} \text{A C} \dots\dots\dots \\ \text{B C} \dots\dots\dots \end{array} \right.$	10 4	16 7	16 2	17 4	16 5	14 3
T.-F.	C ⁻¹	C	C ¹	C ²	C ³	C ⁴	

Case III. A. K., 29 years of age, deafness for eight months; confined six months ago; membrana tympani moderately retracted, light reflex shortened; watch zero, whisper zero, speech 8". Tuning-forks:

Rinné	A C	A C	A C	A C	A C	
Schwabach.....	{ A C	16	13	8,	7	7
	{ B C	10	9	0	0	0
T.-F.....	C	C ¹	C ²	C ³	C ⁴	

One more case is given as being typical of those cases of neurasthenia engrafted upon a previously existing middle-ear affection.

Case IV. D. W., 15 years of age, has been over-studying and at the same time undergoing a series of operations upon the throat, complains of hardness of hearing in one ear for three years, much worse lately; no tinnitus; has "catarrh"; scarlet fever with slight discharge one year before; quite hysterical; watch heard zero, whisper 20 ft., Galton $1\frac{7}{10}$. Tuning forks:

Rinné	B C	B C	B C	B C	=	=	
Schwabach....	{ A C	0	0	0	8	18	14
	{ B C	7	11	6	8	10	13
T.-F.	C ⁻¹	C	C ¹	C ²	C ³	C ⁴	

Two visits were required to complete the examination, her hearing power becoming almost *nil* to the forks after a few moments use. The pre-existing middle-ear trouble had been much aggravated by the strain upon her nervous system of the anticipation of the various operations and of scholastic examinations.

In these cases the duration by B. C. was reduced throughout as compared to the normal; the upper tone limit was little, if any, impaired (by Galton) in many, above 2 on the scale being practically normal. The duration by B. C. was quickly lessened, for any fork, if another had just previously been used, thus indicating extreme nervous debility. The testing was ill-borne, and burdensome. Under treatment directed to the middle ear very little improvement was attained, but by means of rest and tonics, hearing was improved, as was also the duration of the tuning-forks, by both A. C. and B. C., the latter often to twice its former duration in time.

Etiologically, over-work, especially of the brain, is of the most importance: either along one line, as in teaching, or along too many lines, as, for instance, with the young business man who indulges a craving for athletics and social life. In recent years, the influenza has frequently left the nervous apparatus unstrung. Pregnancy, with its attendant ills, is one cause that is apt to injure profoundly the acoustic nervous apparatus, and when repeated often impairs the hearing more and more. Masturbation, that cause-all for indefinable nerve manifestations, here crops up its hydra-head; with reason, however, as all sexual excesses, especially the perverted, are disposed quickly to damage the eye and ear. These various causes, with others unmentioned, probably influence a disturbance in vaso-motor control, so that either a state of hyperemia or anemia is induced in the labyrinth or at the auditory center, which continuing for a certain length of time, produces the typical symptoms. It is probable, that in a well-balanced person, these causes would provoke but little response, but in those inclined to nerve derangements they are sufficient to create effects. The finger can not be placed upon any definite pathological changes as existing in any structure, either because there are none (Gray) or because they have not as yet been discovered.

The treatment is that of general neurasthenia: rest, tonics, and, as so ably emphasized by Gray, fresh air more than exercise. The more air and rest the better. Exercise is to be indulged in with great caution and under competent supervision. The use of drugs is deprecated by many, but the writer has certainly seemed to gather benefit from the judicious exhibition of strychnia, either alone or in combination with the bromid of potassium.

The prognosis is good where the treatment is conscientiously carried out: relapses, however, are by no means uncommon.

147 Remsen street, Brooklyn.

ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY

*A QUARTERLY JOURNAL OF PRACTICAL OPHTHALMOLOGY,
OTOLOGY, RHINOLOGY AND LARYNGOLOGY.*

EDITED BY

JAMES PLEASANT PARKER, M. D.,

SAINT LOUIS, MISSOURI.

Subscription Price, Including Postage in North America:

PER ANNUM, IN ADVANCE,	. . . . .	\$5.00
SINGLE COPIES,	. . . . .	1.25

SAINT LOUIS, MISSOURI:

VOL. III.

OCTOBER, 1894.

No. 4.

CLINICAL MEMORANDA.

EAR FAINTS AND EPILEPSY.

By C. M. HOBBY, M. D.,

OF IOWA CITY, IA.

EVERY one treating diseases of the ear has probably noticed the frequency with which ear patients faint; they faint when the ear is syringed, when it is wiped with cotton, when any operation is performed upon the membrane, and with so little reference to the amount of pain suffered that it would seem that there must exist some physiological reason why syncope should occur so often in ear cases, while it so seldom happens in eye cases. There are, moreover, peculiarities in the fainting of ear patients, which seem to have escaped the attention of writers upon the subject: peculiarities which often distinguish the loss of consciousness in ear cases from ordinary syncope, and which have suggested to the writer the relationship of such cases to the minor forms of epilepsy.

In ordinary syncope there is usually more or less of anticipatory phenomena, such as pallor, sighing, etc., which suggest the

approaching faint in time for the watchful surgeon to arrest the process; but in the peculiar form referred to, the patient, without warning, slides down in the chair, the eyes roll up, unconsciousness supervenes without pallor, a slight stiffening of the body follows, sometimes preceded by one or two slight contractions of the extremities, sometimes there is grating of the teeth, then a gentle sigh, a look of surprise and the attack is past.

The absence of pallor, of dilated pupils, of nausea before and after; the presence of contractions, the rigidity, and the rapid recovery, mark the distinction between such an occurrence and ordinary syncope. In the writer's experience, one-half of the ear cases which have lost consciousness during treatment have presented symptoms that indicated that the loss of consciousness was of an epileptic character.

PRISMS.

By C. M. HOBBY, M. D.,
OF IOWA CITY, IA.

WITHOUT considering the value of prisms in the treatment of muscular anomalies and incoördinations, it is apparent that an erroneous theory of the action of prisms is prevalent, which often leads to disappointment in practice, but oftener to a lack of appreciation of the value of muscle training in treatment of apparent insufficiencies of the ocular muscles.

This theory is to the effect that prisms aid in the exercise of the ocular muscles as dumb-bells aid the exercise and development of the muscles of the chest, arm and back. A little consideration shows that this proposition is unfounded, the dumb-bell resists muscular contraction, and makes it necessary for the muscle to put forth increased strength, but in no manner interferes with coördination; the prism, on the other hand, interferes directly with coördination, but in no case adds anything to the resistance, or to effort required, and therefore cannot aid in the development of muscular strength. In disciplining or training the co-ordinative impulse prisms may be of assistance, but the writer believes that the same attention to effort, and the same repetitions of movement, would accomplish the same results without the prism.

IMMEDIATE CAPSULOTOMY FOLLOWING THE
REMOVAL OF CATARACT.BY GEO. F. KEIPER, A. M., M. D.,
OF LAFAYETTE, IND.

EYE AND EAR SURGEON TO ST. ELIZABETH HOSPITAL.

THE above is the title of a paper by Dr. L. Webster Fox, which appeared June 2, 1894, in the *Journal of the American Medical Association*. This operation has become a favorite with me, and because of a slight difference in the use of instruments I will relate a case.

March 12, 1894, Mrs. E. C., 74 years of age, was brought to my office for examination of her blind eyes. Cataract was discovered to be the cause. Operation upon the right eye was advised and the advice accepted. March 17, at St. Elizabeth Hospital, the extraction of the lens was attempted. The usual procedures were gone through with plus iridectomy because of a sluggish iris. Close inspection revealed opaque posterior capsule. Feeling that under any circumstances she could be no worse than she was, I introduced Dr. Eugene Smith's modification of Knapp's capsule forceps and seizing the capsule tore it open forcibly. The loss of vitreous was insignificant. Her recovery was uneventful. June 7th we adjusted a + 10.00 D. lens and secured vision of $\frac{20}{80}$.

Dr. Fox recommends a gold enameled hook. I believe the capsule forceps will be found easier of manipulation.

A CASE OF VASO-MOTOR RHINITIS.

BY HOWARD S. STRAIGHT, M. D.,
OF CLEVELAND, OHIO.LECTURER ON DISEASES OF THE THROAT, NOSE AND EAR IN THE WESTERN
RESERVE UNIVERSITY.

IN April, 1893, a man, 35 years of age, in perfect health, came to consult me as to a nasal trouble from which he had suffered for the last two years and a half. Before that time he had had no trouble with his nose. His first attack occurred in August, while he was working at the electrical outfit of a street railroad motor. His friends told him he had hay fever. For a few weeks he put himself under the care of a very able physician, who gave him sprays of oil, cocain, etc. From this treat-

ment he received no benefit, and he consulted another physician, who cauterized the turbinated bodies with chromic acid. For a few weeks he thought he was benefitted, but at the end of six weeks he was as bad as ever. For a year after this time he took patent medicines for a time, but finally abandoned everything. About eight months before coming under my observation he consulted a third physician, who repeated the chromic acid applications. The use of the chromic acid the second time did not afford even temporary relief. For the next few months there was no change in his condition. He complained of periodical sneezing, excessive discharge from the nose, stuffiness, lacrimation, etc. His symptoms during an attack were those of ordinary hay fever. He never had any asthma, nor had he at the time of the attack any constitutional symptoms. The attack would come on suddenly without any warning, and would last from one day and a half to two days. He was more liable to an attack during wet weather, but they occurred winter and summer about every two weeks. During the interval he had no trouble with his nose. The sneezing was worst mornings on rising. He said that he would sneeze possibly 200 times during the day. The discharge from the nose was so great that he used to keep four or five handkerchiefs in his room, and would wash them out when saturated and then dry them on the radiator. His work was largely inside, as he was the electrician of a large business block. At meal time the discharge would drop into his plate unless he was careful. He had no headache more than the feeling of frontal fullness. He made his first visit to me during the time of freedom from attack.

An examination of his nose revealed narrow nasal passage, but no abnormal contraction. There was no deviation of septum, no hypertrophies, no sensitive areas, and nothing that seemed to me to require any local interference. He had no disturbance of any other portion of the upper air tract. He was informed that the condition of the nose was normal; that the chromic acid cauterizations had reduced any hypertrophies that might have been present; that he had already had local treatment enough, and that some soothing application seemed to me the only treatment indicated. An alkaline wash was first suggested. Then a menthol and albolene spray. His reply was that he had already used everything suggested without any benefit. I refused to do anything locally because I saw no condition requiring local treatment, and he went away without being willing to make another trial of alkaline washes, etc. After a few days he returned in the midst of an attack. He was suffering very great discomfort and he begged me to do something for him. I confess I did not know what to do, he had already tried everything that seemed to me to offer any hope of relief. This attack, like all the others, came to an end. He returned, and I again went over the case carefully. I could find no reason for any change of opinion. For three months he continued his visits. He would come about once a week. The refusal to treat locally was persisted in because no reason appeared for change of opinion. The more I saw of the case the more I became convinced that the fault was more due to a nervous disturbance than that it was inflammatory in its nature. The idea of a very superficial cauterization with the galvanocautery in the hope of producing a sedative effect upon the end nerves occurred to me from reading the chapter on Hay Fever in Dr. Carl Seiler's

"Diseases of the Throat." There was no thickened tissue. The cauterization was therefore made as superficial as possible. I took a large, flat burner and cauterized a portion of the mucous membrane of the lower turbinated. The cautery was applied in this way twice on each side to the anterior half of the lower turbinated only. The septum and middle turbinateds were not treated. He pronounced himself better after the first treatment and wanted me to hurry up and treat the other side. After the slight reaction from the cauterization passed away he had no trouble at all for three months. Since last December he has occasionally felt a slight discomfort in the nose, and has sneezed a little for a few hours during wet weather. There has been no return of the discharge. He says that he is nine-tenths relieved of his trouble.

Comments on the case seem to me to be unnecessary. The case has been one of great value to the writer. This report has been withheld for months to be certain that the result thus far obtained is a permanent one. Whether the condition in which I found him might not return if he became depressed from overwork, worry, etc., is an open question. If he had taken constitutional treatment the possibility of recurrence would be more worthy of consideration. He complained most of the discharge and sneezing. The sneezing was the most troublesome, for he would sneeze until he was nearly "torn asunder." The cauterizations were entirely confined to the respiratory part of the nasal passages, and yet the beneficial effect upon the olfactory area seemed as pronounced as in the area to which treatment was directed.

185 Euclid avenue.

ABSTRACTS FROM FOREIGN OPHTHALMIC JOURNALS.

By CASEY A. WOOD, C. M., M. D.,
OF CHICAGO.

THE SURGICAL TREATMENT OF TRACHOMA. TREATMENT OF THE
NOSE AND NASO-PHARYNX IN OCULAR DISEASES. THE RELATION
OF POST-NASAL ADENOIDS TO SPRING CATARRH. THE
ORGANISMS THAT INHABIT THE HEALTHY AND THE
DISEASED CONJUNCTIVAL SAC. TEARS AS A
GERMICIDE. MECHANICAL CLEANSING OF THE
SAC BEFORE OPERATIONS ON THE EYE.
THE THERAPEUTIC VALUE OF OINT-
MENTS IN EYE DISEASES.

Dr. Venneman¹ has tried all the operative methods employed in treating granular lids and they have *all*, in his hands, been productive of good results, and every one—expression of the granulations, excision of the cul de sac, scraping, curetting, the use of the hard brush on the everted mucosa, with and without previous scarification—has been *equally* successful.

With this experience he is inclined to believe, as Panas does, that every operation on the lids, attended by loss of blood, is of value in the treatment of granular ophthalmia. The hemorrhage acts by depletion of the local blood vessels and lessens the activity of the inflammatory processes in the acute and subacute forms of trachoma. In the chronic variety the benefit obtained also springs from the destruction of the nutrient vessels.

Moreover, in simple canthotomy and canthoplasty one cuts off a portion of the vascular supply to the lids, just as in excision of the superior cul de sac a great many arterioles furnished to the palpebral conjunctiva are divided. So it is in "grattage," curetting

¹ E. Venneman. Le traitement chirurgical des granulations. *Archives d'ophtalmologie*. Juillet, 1894, p. 413.

and the use of the hard brush; there is indirect destruction of the conjunctival capillaries themselves.

Partisans of one or other of these various surgical methods of treating trachomatous lids appear to be working along the same lines. They desire, while removing or destroying the granular tissue, to leave intact the healthy conjunctiva. But Venneman believes, as the result of several years study of the subject, that it is a great mistake to suppose it possible to be able to destroy the granulations without injury to the mucous membrane of which they form a part. Indeed, the trachomatous granule is a transformed lymphatic corpuscle. *i. e.*, is not a separate new formation, but is the conjunctiva itself unequally hypertrophied and transformed into conjunctival embryonic tissue. The lymph corpuscle is a body absolutely innocent of all the damage done by the disease to the conjunctiva, and, by extension, to the globe itself. This lymphatic follicle is merely an accidental element in trachoma; it may disappear without leaving any trace and certainly never gives rise to cicatricial tissue. It is only in the large granulations, also, that one finds those bodies which have been called the "corpuscles of Flemming."

The number of normal lymph corpuscles in the diseased conjunctiva is very variable. The chief thing to be borne in mind is that whatever removes the embryonic tissue, constituting with the trachoma bacillus the disease called granular lids, kills off so much healthy conjunctiva.

The author prefers a combined method of treatment and practices a superficial removal of epithelium by Desmarre's scarifier, combined with sublimate irrigation of 1:500 solution.

On each of the following three days the conjunctiva is rubbed with tampons of cotton wool saturated with the same solution.

Cocain is needed only for the scarifying; there is usually no pain or reaction, but if any occurs cold compresses are to be applied. This is to be repeated daily if necessary.

The results are most beneficial. After two or three days a false membrane forms over the conjunctiva which, when rubbed off by the tampon, does not bleed. The author also regards the appearance of the false membrane as a good sign and thinks that it indicates an early recovery from the disease. He ascribes the good results of this combined treatment to the direct action of the corrosive sublimate on the microbes and their morbid products.

Relapses are less likely to occur if the patient's general health and surroundings receive attention.

TREATMENT OF THE NOSE AND NASO-PHARYNX IN OCULAR DISEASES.

Guibert¹ reviews very shortly the literature which he says is not voluminous. He insists that the coincidence of many ocular and nasal affections is not merely accidental, but that when present infection of the eye has generally followed the disease of the nose. He found, for example, in a young man from whose nose he had extracted ten polypi a paresis of accommodation and a slight degree of asthenopia. He finds the commonest ocular symptoms, that result from disease of the pituitary membrane, to be lachrymation (simple or associated with dacryocystitis), inflammation of the nasal and lachrymal canals (due to ascending disease of their mucous lining). Relief of the eye symptoms is always assisted by cure of the nasal trouble.

Empyema of the frontal, maxillary and sphenoidal sinuses frequently affects the visual apparatus, most often causing neuralgia and asthenopia, the operation of which cannot be explained, unless they result from compression or paralysis of the nerve supply.

A friend of the author had an intense neuralgic pain in the left eye, made worse by pressure on the supraorbital nerve. The left upper lid was slightly swollen, but the eye itself appeared normal, both externally and internally. For several days the patient had a serious coryza, the secretion being more abundant on the left side, and this was associated with tenderness on percussing over the left frontal sinus, a symptom absent on the right side. This frontal sinusitis was duly treated and in four days the eye troubles entirely ceased.

The writer also refers to those cases, for some years past abundantly reported in our medical journals, where the cauterization of a hypertrophied spongy bone, or the removal of a polypus, has cured obstinate cases of asthenopia.

Although not so frequently mentioned, yet of frequent occurrence and of vast importance, is the dependance of ocular diseases upon the presence of adenoid vegetations in the naso-pharynx. Guibert thinks these are very common, especially in strumous children. He has often seen inveterate forms of spring catarrh, keratoconjunctivitis, strumous ulcers of the cornea, photophobia and various forms of conjunctivitis simplex promptly cured by the removal of these post nasal growths. Indeed, in many cases the

¹ Du traitement rhino-pharyngien dans les affections oculaires. *Recueil d'ophtalmologie*, Juillet, 1894, p. 391.

improvement began the next day after the operation, and both parents and surgeon were able to witness a decrease in the ocular congestion and other eye symptoms.

The exact manner in which diseases affect the eye from the nares through the nerve supply, the blood vessels, the lymphatic system or by contiguity of mucous tissue, is of less importance than the clinical fact that treatment should include antisepsis of the nasal passages, by douches, gargles, insufflation of powders, and the use of other remedies—such as operations on the nose and pharynx (cauterization, removal of polypi, adenoid growths, etc.) when these are indicated.

THE MICROBES FOUND IN HEALTHY AND DISEASED CONJUNCTIVAL SACS.

Bach,¹ in the course of a very extensive clinical and experimental study of the organisms found in both the healthy and diseased conjunctival sac, asks and answers these questions: (1) Is the conjunctiva, when apparently normal, always to be regarded as infected? (2) What part do its secretions, normal and pathological, take in the diminution and increase of bacteria? (3) Is it possible by artificial means, to render an infected sac sterile? (4) If so, what method is most likely to attain this end?

The writer claims that, in common with other observers, he has found bacteria in the great majority of cases where the sac appeared to be entirely normal and that, consequently, it is safe to assume that *every* conjunctiva is infected with germs. Of the inhabitants of this locality he has discovered no less than ten micrococci that liquidize gelatin, and eight others that do not effect it. Of the bacilli liquidizing gelatin there were four; of those that did not effect it, one. These bacilli were none of them pathological and four were first found in the sac by the author. The rose fungus, two hyphomycetes (threads short and long; sometimes spirilla-like), mould fungi and two unknown bacteria were also discovered.

Of these twenty-seven organisms Bach gives the following description of ten pathological examples, in which we are most interested.

The pathogenesis of the various bacteria was determined by carefully removing the epithelium from minute spots in a

¹ Ueber den Keimgehalt des Bindehautsackes dessen natürliche und künstliche Beeinflussung sowie über der antiseptischen Werth der Augensalben. *Graefe's Archiv, für Ophthalmologie*, Vol. XL, 3, p. 131.

disinfected rabbit's cornea and implanting therein the isolated organism. Control experiments were also made.

1. *Micrococcus albus liquefaciens* of Besser. Found in the nares, and twice, by author, in the conjunctival sac. *Pathogenesis*; in the immediate neighborhood of the corneal infection a slight gray infiltration, which disappeared in about four days. Moderate amount of pericorneal injection, which lasted but a short time. No iritis.

2. *Micrococcus pyogenes aureus*, found frequently in the sac. Extremely pathogenic and destructive.

3. *Micrococcus pyogenes albus*. A frequently found and actively morbid organism.

4. *Micrococcus flavus liquefaciens*. Described by Flügge as a bacterium whose habitat is wind and water. First discovered in the sac by writer. In rabbits produces corneal ulcer and well marked muco-purulent secretion.

5. *Diplococcus citreus conglomeratus*. Found in blennorrhoeic discharges and in aerial dust. After twenty-four hours a well defined gray infiltration of inoculated point, which disappeared in three days. Pericorneal injection, but no iritis or hypopyon.

6. *Micrococcus aurantiacus*. Described by Cohn as a water bacterium, but twice found by author in the conjunctival sac. Produces a gray infiltration (about the point of corneal infection) which does not long persist.

7. *Staphylococcus cereus flavus*. (Passet.) Found once by author. A rare pyogenic coccus. Twenty-four hours after inoculation, corneal ulcer with iritis and sometimes hypopyon.

8. *Micrococcus coryze*. Discovered by Hajek in the serous discharge of acute rhinitis and found by author in the sac. Infiltration of infected corneal puncture, with pericorneal injection and iritis but no hypopyon.

9. *Streptococcus pyogenes*. Sets up at once a rapidly spreading ulcer with iritis and hypopyon.

10. One unknown bacterium, resembling the *micrococcus candidus* of Cohn. The writer frequently found this in the sero-pus of acute conjunctivitis, and once in the mucous discharge from the conjunctiva in a case of xerosis conjunctivæ, and dubs it *micrococcus conjunctivitisidis minutissimus*.

After introducing into the conjunctival sac certain germs, from which that region and the nose were shown to be free, Bach concludes that the infection stream is *from* the sac, through the nasal duct into the nose and practically never in an opposite

direction. As long as there was an unobstructed passage, colonies planted in the nose did not pass thence into the sac, although they readily traveled in an opposite direction. Even in the presence of a purulent dacryocystitis bacteria from the secretions did not injure the conjunctiva as long as there was even a partial drainage into the nasal passages.

TEARS AS A GERMICIDE.

To settle the question as to whether tears possess germicidal properties or whether they weaken the morbid action (as most experimenters have found that they do) by simply washing away their colonies the writer made some thirty-seven experiments with various pathogenic bacteria. In sixteen of these, where the bacteria were exposed for an hour to tears warmed to 58° — 70° Celsius, the colonies greatly decreased in ten; in six there was a diminution less marked. In nineteen, where the tears were kept at ordinary temperatures, only four showed an increase in the bacteria exposed to the action of the lachrymal fluid.

Similar experiments were made with the soluble compounds (singly and combined) found in normal tears, with distilled water, with well water and with other simple liquids. *In nearly every case the pathogenic bacteria exposed to them decreased in number and shortly died.*

Further observations of ocular bacteria, exposed to the action of aqueous humor from human subjects, show that the former does not exert any germicidal action worth speaking of.

In the same way, it was shown that the staphylococcus pyogenes aureus, as the ideal pathogenic organism, flourishes kindly in a soil of vitreous humor.

Before operations upon the eye the author is strongly in favor of washing out (and so mechanically cleansing) the palpebral edges and conjunctival sacs with the physiological solution of common salt, in imitation of nature's cleansing process—the overflow of tears. He believes that this should, at any rate, always be carried out as an adjunct to such germicidal applications as sublimate, chlorin water, mercuric trichlorid, etc. Franke's statistics, where of 130 cases only 24 per cent showed a diminution in the number of bacteria after careful application of these antiseptics, are adduced as evidence of the inefficiency of germicidal solutions. The author places great stress upon mechanical removal of the germs by thorough irrigation and cleansing (with damp cotton) of all parts of the external eye, and asserts, as an

outcome of such observation, that better results are obtainable by the use of indifferent solutions, applied for their mechanical effects, than from antiseptics employed on account of their germicidal qualities. His experiments in this direction are interesting.

In thirty-nine cases (thirty-five lid margins, forty-two sacs) of infectious disease of the anterior portions of the eye he carefully disinfected the lids and sacs after the most approved style of the antiseptic school, and then counted the bacteria developed in sterilized agar after it had been infected with a platinum spatula previously rubbed over the cilia, lids and conjunctivæ. Shortly afterwards he irrigated and cleansed the parts with the salt solution and compared the results with the former. He found, after the use of the salt solution (1) that the number of organisms inhabiting the lids was sensibly diminished in 42 per cent of the cases; the sac, 30 per cent. (2) The palpebral edges were rendered sterile in 50 per cent; sac, 40 per cent. (3) Failure to effect any change, lids once; sac, three times.

THE DISINFECTANT ACTION OF EYE SALVES.

As a result of experiments with them Weeks has not much faith in the germicidal action of the ordinary eye ointments, but Bach, while admitting the uselessness of even a 10 per cent iodoform ointment, concludes, after many bacteriological observations, that *pure American vaselin is a valuable bactericide*, and should, when possible, be employed as a vehicle for remedies. Experiments with sublimate salves, 1:3000, and silver nitrate, 2 per cent, showed that myriads of cocci, collected on a platinum spatula, were killed in a few minutes by immersion in them. Yellow ointment, 1 per cent, was not so lethal, while boric acid, 3 per cent, had little or no effect. Bach also made a number of experiments with the surface layer of the boxes of ointments in everyday use in the Würzburg Eye Klinik (including the above named salves and a $\frac{1}{2}$ per cent mixture of lead acetate) and did not discover, in a single instance, the presence of bacteria.

Finally, the author believes that by the use of sublimate vaselin for twenty-four hours the sac and lids may be sterilized in all cases where the colonies are not too numerous and where one has not to deal with a too abundant supply of the staphylococcus pyogenes aureus.

[I have long believed and acted upon the belief that in cases requiring the application of remedies to the cornea, conjunctival

sac and lid margins the best results are obtained by their exhibition in the form of ointment and not as collyria. Moreover, the effect of such applications is greatly increased by applying them, on a probe, to the everted lids and then gently rubbing them over the eyeball (massage) for two or three minutes. As an example of this, citrine ointment, made with cod liver oil instead of the official neatsfoot oil, forms a smooth, stable, semi-liquid ointment of a dark brown color (which may be diluted to any strength by the further addition of cod liver oil) that lends itself to bulbar massage with admirable effect. So do yellow ointment, rendered partially fluid with albolene, *unguent hydrarg.*, diluted with cosmolin, and many others.

C. A. W.]

REPORT ON PROGRESS—OPHTHALMOLOGY

REVIEW OF CURRENT AMERICAN AND ENGLISH OPHTHALMIC LITERATURE.

BY CHARLES H. MAY, M. D.,
OF NEW YORK.

RECENT EXPERIENCE IN THE TREATMENT OF DETACHMENT OF THE RETINA, WITH A DETAILED REPORT OF THIRTY-EIGHT CASES.

Charles Stedman Bull, M. D., New York, (*New York Medical Journal*, September 1, 1894). Of the thirty-eight cases reported upon, thirty occurred spontaneously and eight as the result of traumatism. All cases were subjected to the following treatment: Rest in bed on back; atropin in one or both eyes; bandage to affected eye. This treatment was kept up for a period of from three to eight weeks. Pilocarpin hydrochlorate was injected hypodermically in twenty-five cases; commencing with a minute daily dose, it was increased to toleration. "In a number of these cases the drug produced such unpleasant or alarming symptoms that it was necessary to discontinue it. My experience has taught me that it should not be prescribed in persons suffering from functional or organic heart disease." When pilocarpin was not

well borne or contraindicated, small doses of bicarbonate of sodium and potassium iodid, largely diluted, to induce free action of the kidneys and bowels were given. Corrosive sublimate in small doses was given in cases complicated by iritis and choroiditis and in cases of extensive opacities of the vitreous. Puncture of sclera into subretinal space, subconjunctively, in nineteen cases; division of membranous bands at the vitreous end of the detached retina, in seven cases.

As regards the results of this treatment: There was temporary improvement in vision and in extent of the detachment, varying from a few weeks to several years, before the vision became reduced and the detachment increased, in twenty-three cases; no improvement whatever in eleven cases; apparent permanent cure, with entire disappearance of the detachment and restoration of useful vision in four cases. "There was little or no reaction following puncture of the eyeball through the sclera, or after division of the detached retina and the membranous bands in the vitreous, in any of the cases."

Dr. Bull believes the following conclusions justified by the results of the treatment of these cases:

1. The science and practice of ophthalmology have as yet discovered no better means of dealing with detachment of the retina than the old methods which have been advised and carried out for so many years, *viz.*, rest on the back in bed, atropin, a bandage, and the internal administration of some drug which may induce absorption of the subretinal fluid.

2. The continued use of pilocarpin, either hypodermatically or by the mouth, may cause great prostration, even in cases in which it is apparently well borne; and the desired effect may sometimes be produced by small doses of bicarbonate of sodium and iodid of potassium largely diluted with water.

3. In all recent cases, puncture of the sclera subconjunctively may do good temporarily by letting out the subretinal fluid and allowing the retina to collapse, thus producing some improvement in the vision; but the apparent improvement is generally transient, and when membranous bands exist in the vitreous no improvement can be expected from simple puncture.

4. Division of fixed membranous opacities in the vitreous causes but little reaction, and may do positive good without division of the detached retina, as it reduces the danger of extension of the detachment. It is positively contraindicated in cases where the vitreous opacity is vascularized, as it would certainly induce free

hemorrhage into the vitreous. It should never be done in an irritated or inflamed eye.

5. Division of the detached retina, which allows the subretinal fluid to escape into the vitreous, may always be done in a quiet eye, and causes little or no reaction. If membranous bands are present in the vitreous, these should also be divided at the same time.

6. In most cases all these operative procedures produce but temporary improvement, and in many cases no effect whatever is gained by them.

7. There seems no good reason for any further indorsement of the method advocated by Schöler, but every reason for rejecting it from the domain of ophthalmic surgery.

THE SHADY SIDE OF THE SURGICAL TREATMENT OF TRACHOMA.

H. Clifford, M. D., Omaha, Neb., (*Medical Record*, August 25, 1894). The writer calls attention to the fact that although the surgical treatment of trachoma gives better results than the treatment with local applications of any kind of medicines alone, the disadvantages and dangers of the treatment have been little dwelt upon. Nearly one-fourth of his patients come to him for trachoma and he has been subjecting their lids to the most rigorous kind of surgical treatment for the past seven years. Without belittling the immense advantages of the surgical measures, he points out "that the brilliant results claimed by so many writers are not, as a rule, to be expected, and that disastrous results may follow their use in some, if not all classes of cases." He contends that the claim of many writers to cure the great majority of cases in from four to six weeks is based upon too brief observation; if these patients are kept track of, relapsing will be found to be the rule. "In many cases, I have gained the impression that corneal complications are more apt to occur in the relapses following so-called cures with surgical means, than when medical applications alone have been employed. When the diseased tissue is so localized that it can be easily excised, squeezed, or scraped out, a cure can sometimes be effected with one operation; but, generally, after all the surgical treatment that is advisable, in the course of a month or six weeks, I find it desirable to have patients continue applications of sulphate of copper for many months, returning

occasionally for such further surgical interference as may be required."

"With regard to the dangers of surgical treatment, the bad results which I have observed or known to follow it are, first, suppression of tear secretion, with resulting xerophthalmia: second, ulceration of the cornea, with partial or complete loss of sight." The writer speaks of several cases of the first sort in which the patients experienced no serious inconvenience from the reduction of tear-secretion: in one old case, however, the eye became xerophthalmic. Regarding corneal ulceration, he has seen slight erosions develop immediately after surgical treatment, but he attributed the majority of these to the free use of cocaine.

"Really dangerous corneal trouble from surgical trachoma treatment. I have observed only from the aggravation of pre-existing corneal affections by the operation. Most writers speak of the rapidity with which corneal complications heal after the lids have been treated surgically, and in the great majority of cases this has been my experience also. Trachomatous pannus, in particular, clears up with rapidity after proper surgical measures. On the other hand, I believe that non-vascular ulcerations, whether superficial or deep, should be considered positive contraindications to any extensive surgical interference with the lids. Not that they will not, as a rule, be helped by such interference; for they generally heal promptly; but in rare cases, without our being able to foresee the dangers, they become so rapidly worse after operations for trachoma that the sight is severely injured, or entirely destroyed, before they can be checked. I have had two experiences of this kind and know of three others.

Continuing, the writer describes these unfortunate cases and concludes his paper as follows: "These cases make it plain, I think, that surgical measures have not simplified the treatment of trachoma: on the contrary, they have made it altogether more imperative that he who uses them should be able to examine the eye with the greatest care and discrimination; and should be prepared, if unusual emergencies arise, to treat them promptly and vigorously. Without these qualifications, the physician had far better stick to the old bluestone and nitrate of silver treatment: for with these remedies the disease can always be improved or held in check, and in many cases cured; whereas, if he uses surgical measures at all freely, while he may, as a rule, obtain more brilliant results, he is liable, at any time, to ruin an eye which otherwise would not be lost."

THE TREATMENT OF TRACHOMA OR GRANULAR CONJUNCTIVITIS.

Kenneth Scott, M. B., C. M., F. R. C. S., Edin., Cairo, Egypt, (*British Medical Journal*, Sept. 15, 1894). Mr. Scott's experience with a great number of cases of trachoma leads him to recommend in highest terms the use of a four per cent solution of cyanid of mercury. Formerly he had used the four per cent solution of bichlorid of mercury; he was led to change to the cyanid only on account of the discomfort and pain attendant upon the application of the bichlorid solution. The cyanid he found in no way detrimental to the cornea even though ulceration existed, less painful than the bichlorid and equally efficacious; if anything, the cyanid effected a cure in less time than the bichlorid. He advises the daily thorough application with a brush to the everted lids of an aqueous four per cent solution, and the instillation two or three times daily of a $\frac{1}{4}$ per cent solution of the same salt "whatever the condition of the cornea may be, it never need be considered in regard to the application of the cyanid solutions, as I have never seen any caustic or permanent irritative effects produced by it. The bichlorid of mercury solution, however, must always be employed with care in this respect."

"I have tried the operative procedures which are often advocated, such as squeezing, etc., in conjunction with both the bichlorid and the cyanid forms of treatment; and have compared it when performed in one eye, with the simple treatment followed in the other eye, but have never found any increased benefit accruing which would induce me to adopt it invariably."

He reports his cases as cured after an average duration of from three to six weeks. He has had great success in the treatment of acute and chronic purulent and catarrhal conjunctivitis with solutions of this salt and also "that form of granular conjunctivitis which is seen in long-continued or neglected chronic catarrhal or purulent conjunctivitis, but which is quite distinct from proper granular conjunctivitis or trachoma."

THE TREATMENT OF EPILEPSY BY TENOTOMY OF THE EYE MUSCLES AND BY OTHER SURGICAL MEANS.

Casey A. Wood, C. M., M. D., (*New York Medical Journal*, July 7 and 14, 1894). Dr. Wood's very able article discusses the eye treatment of epilepsy and enters into an examination "of such other procedures as are likely to explain the *modus curandi* of ocular muscle-cutting in a certain class of epileptics." He men-

tions a number of cases of his own, dissects Dr. Ramey's recent report of twenty-five cases and then gives numerous instructive and entertaining extracts from literature bearing upon the subject of the value of various surgical procedures which have been in vogue at various times for the cure or relief of epilepsy.

He concludes his paper as follows:

1. Heterophoria in some form, latent or manifest, can be shown to exist as an ocular condition in fully ninety-five per cent of all individuals.

2. Alone and when associated with ametropia it is not an uncommon cause of so-called asthenopia.

3. In the latter case, the correction of the accompanying refractive error in the large majority of cases relieves all the symptoms set up, both by the ametropia and muscular anomaly; when it does not, the heterophoria may be said to be responsible for the asthenopia.

4. It is highly probable that when epilepsy is in part or wholly the result of eye-strain, other evidence of the latter is present.

5. It must follow from the foregoing that in the eye-treatment of epilepsy of any decided degree, the correction of the ametropia, and not the correction of the heterophoria, is the first and most urgent duty of the ophthalmologist, and in cases where both are corrected at the same time, it is fair to suppose that the results, if any, are due to the ametropic correction.

6. In cases of epilepsy with heterophoria and ametropia, or where the correction of refractive errors has failed to relieve the asthenopic symptoms and the production of orthophoria is followed by cure of the epilepsy and the asthenopia, it is just to say that the operation on the eye muscles or treatment of them has produced the effect of stopping the convulsions.

7. In the absence of the ocular symptoms, apart from the epilepsy, an operation upon the eye-muscles stands in the same therapeutic relation to a cure or relief of the disease as do other surgical procedures that have, during the past century, been in vogue, such as tracheotomy, setons, ligature of the vertebral arteries, trephining, oöphorectomy, circumcision, castration, the actual cautery, the resection^s of stray scars, and so on.

8. These operations bring about a cure or relief of the epilepsy (both idiopathic and hystero-epilepsy), by their powerful mental effect upon the patient, a truth long recognized by neurologists.

9. Genuine cures of epilepsy by eye-treatment of any kind must necessarily be confined to those cases where a faulty ocular

apparatus acts as a peripheral irritant. It remains yet to be shown what anomalies of the extrinsic muscular portion of that apparatus are to any large extent responsible for the seizures of epilepsy.

10. The eye-treatment of epileptics who present signs of ocular distress has not received that attention which the importance of eye-strain in the category of reflex irritants seems to call for. The eyes should be carefully examined in every case of epilepsy where asthenopic symptoms are present or are suspected.

11. I question the wisdom of encouraging the profession and through them the laity to believe that *every* case of idiopathic epilepsy is a suitable one for eye-treatment, but prefer to say that only those cases are fit subjects, in the proper scientific sense, for eye-treatment whose visual organs are palpably the source of irritation giving rise to symptoms generally included under the term eye-strain.

12. That when all remedies fail, some such operation as Reynolds suggests, easy to perform, perfectly safe, and yet of a severity and character tending to make a lasting impression on the patient's mind is indicated. I would suggest the removal, at intervals, of small pieces of skin from various parts of the body, the denuded spots being allowed to heal by granulation.

THE IMPORTANCE OF MAINTAINING EQUAL ROTATIONS OF THE EYES AFTER OPERATIONS ON THE OCULAR MUSCLES.

George T. Stevens, M. D., New York. (*British Med. Journal*, Sept. 15, 1894). Dr. Stevens calls attention to the misleading character of the term "the squinting eye" in cases which are not strictly of a pathological character. He dwells upon certain conspicuous facts in relation to concomitant squint and discusses the causes of strabismus. All this serves as introduction to his criticism of the universal habit of correcting squint by division of an internal rectus of the squinting eye; this may remove the deformity of strabismus from the cosmetic point of view, but often fails to establish binocular vision which should be the supreme motive for the operation.

"Continuous binocular vision can only exist where there is approximate equality of tension of corresponding muscles of the two eyes, and easy binocular vision is only possible when the nervous impulse for the direction for one eye is exactly similar to that for the other. Corresponding action of two interni cannot be maintained, and in some cases cannot be even temporarily induced, in

a case in which the rotating power of one internus has been reduced, while the other remains intact and excessive.

“Here lies the secret of Von Graefe’s cases of ‘antipathy to single vision,’ cases which are infinitely more common than is generally supposed and cases which, according to my own observation, occur only after operations. When one internus has been cut and another retains its excessive tension, and especially when the image of one eye lies normally in a higher plane than the other, there can be no permanent union of images. Few cases operated upon by the usual methods have any practical binocular vision. By careful attention, not to the gross and most conspicuous phenomena of strabismus, the lateral deviation, but to the essential and important relations of the tensions in vertical as well as in horizontal direction, the failure to obtain practical binocular vision, which is the extremely common result of strabismus operations, may be practically eliminated. An operation properly performed on a superior rectus will often completely relieve a moderate converging or diverging strabismus by removing the necessity for the squint.

“Even if the rotation is to be affected only to the extent of a few degrees, the equilibrium should be maintained. But if the correction of slight strabismus, or even of esophoria or exophoria by relaxation of a single muscle is to be avoided, how much more must we reject the idea of doing a tenotomy on an internal rectus and an advancement of the external rectus of the same eye, while the so-called but miscalled non-squinting eye remains with its original tensions. The precept which I would earnestly impress is one which I have already on former occasions urged, namely, that ‘every modification of a lateral muscle by relaxation or by shortening which can in any degree affect the rotation of one eye should in every instance be accompanied by an exactly equivalent modification of the corresponding muscle of the other eye.’”

NOTE ON THE EFFECT OF PROLONGED EXCESSIVE LIGHT
ON VISION.

George Lindsay Johnson, M. D., F. R. C. S., (*The Medical Press and Circular*, Sept. 5. 1894). “Having systematically examined the vision of the workmen engaged in Salviati’s glass factory, he found a constant relationship between the duration of time that the men were exposed to the bright light of the furnace and the impairment of vision. This defect of vision takes the form of a gradual atrophy of the optic nerve with impaired vision, and a shrinking of the visual field for white, but most for red and

green. In no case did he get a clear history of the atrophy having become complete, but the vision sank to $\frac{20}{50}$ and $\frac{20}{70}$ in those who had been engaged at the furnaces for many years. The red, orange, violet and ultra-violet rays seem to be the injurious parts of the spectrum, the former showing its effects most on the retina and optic nerve, the latter on the conjunctiva and external parts. In no case where the workmen were exposed for several years to the furnace light did their eyes escape without some permanent loss of vision, but those men whose duties were not confined to the furnace, although in the same room and exposed to an equal degree of heat with the rest, escaped more or less completely. The effect of the furnace glare is quite different to that produced by snow, or from that caused by gazing at the sun. The first mentioned being a chronic atrophy, the second being an acute form of blindness, in all probability produced by exhaustion of the visual purple, while the latter is a destructive change caused by direct coagulation and disintegration of the bacilliary layers of cells. The remedy for furnace atrophy appears to be best met by covering the upper three-fourths of the side openings in the furnace with sheets of annealed spectrum blue glass, leaving room beneath for ventilation, and for the workmen to introduce and manipulate the glass. The constant use of spectrum blue spectacles or goggles serve even better, but there are practical objections to their use.

ON THE RELATION OF SOME OCCUPATIONS TO EYESIGHT.

Simeon Snell, F. R. C. S. E. (*The Med. Press and Circular*, August 22, 1894). In speaking of the various occupations in which men are exposed to intense light and excessive heat, Mr. Snell points out the fact that men employed in the large works in which iron is made and converted into steel are exposed to a heat of from 2,000° to 3,000° F. (the temperature of an ordinary grate fire is 500° F.). Such workmen protected their eyes with colored glasses. "Some men were unable to continue exposed to these heats and intense light, but others continued working with them without injury year after year, and, I think that, with protection, they can do so without injury."

Concerning the intensity of the light from some of the processes of the electric light, he states that the effect upon the eye is often injurious, and is becoming recognized. In electric welding the light is estimated at 8,000 candles and the heat 3,000° C. (about 7,000° F.). "Exposure to this light, however brief, brings on the

most excruciating eye pain with great swelling and lachrymation. It is felt immediately, but more violently some hours afterwards." These workmen use helmets with a glass door formed of six layers of glass alternately red and blue, and this protection answers well. The injury to vision in the cases is done by chemical rays and not by the heat rays, and it is thought that ruby glass gives better protection than the combination mentioned.

REPORT ON THE VALUE OF OBJECTIVE TESTS FOR THE
DETERMINATION OF AMETROPIA—OPHTHALMOSCOPY,
OPHTHALMOMETRY, SKIASCOPY.

By the Special Committee of the Section on Ophthalmology of the American Medical Association. (*Journal of the A. M. A.*, September 1, 1894.) The members of this committee were Edward Jackson, M. D., Chairman, Philadelphia; S. M. Burnett, M. D., Washington; H. V. Würdemann, M. D., Milwaukee, and J. A. Thomson, M. D., Kansas City. The committee reported that its members were all "in accord with the view held by most ophthalmologists that objective methods of determining ametropia cannot entirely replace the subjective method with test letters and trial glasses; and that, in so far as the subjective method is applicable, it may be regarded as a court of last resort. Determinations of the refraction by the various objective methods, however, constitute an essential portion of the complete examination of an eye. The accurate determination of ametropia is best accomplished by the use of all these objective methods in each case, and usually in the following order: The ophthalmoscopic examination, measurement of the cornea with the ophthalmometer, skiascopy—these to be followed by the subjective determination, and, if this last does not agree with the previous measurements, its findings should be submitted to re-trial by skiascopy." Regarding skiascopy, the report says in part: "Skiascopy is on the whole the most accurate and reliable objective method of estimating ametropia * * * * it offers for most eyes, a method for the easy and rapid measurement of ametropia, within the limits of practical accuracy for even the subjective method, except in eyes having more than the Snellen normal standard of visual acuteness. For the exceptional eyes, in which it is less accurate, it offers a means which, carefully used, will give confirmation of subjective results, or a better correction than may be obtained by any other method. In nearly all eyes the result of a careful skiascopic correction will give the best or very nearly the best obtainable vision."

SCOPOLAMIN: ITS VALUE IN OPHTHALMIC PRACTICE.

W. Harvey Smith, A. M., M. D., C. M., House Surgeon to the Manhattan Eye and Ear Hospital, New York. (*New York Medical Journal*, July 21, 1894.) After reading Dr. Smith's paper, one is forced to the conclusion that scopolamin excels as a mydriatic, but that it produces much more pronounced toxic symptoms than atropin does when employed in a similar manner; and these toxic symptoms seem to occur in a larger proportion of cases.

"Had it been possible to compare the action of other mydriatics on patients upon whom the scopolamin had been tried, the deductions might have been more absolutely reliable; still, I think the observations so far made justify us in coming to the following conclusions:

"1. That the toxic effect of scopolamin used in one-tenth and one-fifth per cent solutions are easily produced, but can be readily avoided if the lids be everted or the nasal ducts compressed at the time of the instillation.

"2. That in diseased conditions of the eye scopolamin is quite as useful a drug as atropin.

"3. That in refraction work, complete and thorough paralysis of accommodation with the maximum of mydriasis can be produced in from twenty minutes to half an hour, where the drug is used *coup sur coup*, and that the duration of its effects is from five to eight days.

"4. That its greatest value lies in the rapidity of its action, which renders it specially useful for purposes of examination in refraction cases and in diseased conditions of the interior of the eye."

OPTIC NEURITIS IN ITS RELATION TO CEREBRAL TUMOR AND TREPHINING.

Dr. James Taylor, (*The Lancet*, June 23, 1894). Report of meeting of Ophthalmological Society. In this paper, Dr. Taylor alludes to the fact pointed out by Mr. Horsley some time ago—the subsidence of optic neuritis after operation for removal of cerebral tumor, even when the tumor was not removed. He relates nine cases of optic neuritis associated with intracranial tumor, dividing them into three classes, three cases belonging to each class: In the first group of cases, the tumor was removed and the neuritis subsided. In the second group of cases, trephining demonstrated the existence of tumor, but the tumor was not removed; the optic

neuritis, however, subsided. In the third group of cases the optic neuritis disappeared after emptying the cysts and did not recur subsequently when the cysts refilled and there were additions to the tumors.

In conclusion, he states "that, even taking into account the fact that a large cerebral tumor might be present without producing optic neuritis, and that optic neuritis might be present without cerebral tumor, such facts and observations as were related in this paper made it evident, that in certain cases at least, of intracranial tumor, the pressure inside the skull was the effective agent in producing what was known as optic neuritis."

REMARKS ON THE PATHOLOGY OF DESCemetITIS.

Herman Snellen, M. D., Utrecht, (*British Medical Journal*, Sept. 15, 1894). Dr. Herman Snellen remarked that descemetitis or serous iritis was a well-known disease of the eye, but that opinions differed as to its nature. Early observers believed it to be a disease *sui generis*, and applied to it the terms aquo-capsulitis, keratitis punctata, or descemetitis. Later writers looked upon it as a symptom of disease of the deeper parts of the eye, and as the iris was, as a rule, more or less inflamed, applied the term iritis serosa. Treacher Collins regarded the disease as primarily a catarrhal inflammation of the glands of the ciliary body, and Priestly Smith had in consequence suggested the term serous cyclitis in place of serous iritis. Recently, in the case of a lady, 28 years of age, in whom it was found necessary to perform sclerotomy, one of the dots came away with the aqueous humor, and was found on microscopical examination to consist of a conglomeration of microbes. These microbes were cultivated: they grew slowly. When stained with carbo-fuchsin and examined closely, they were seen to be very short bacilli. In the second case a dot was obtained and found to consist of cells with the same microbe between them. In this case the dot was probably older, the cells had been contracted and the microbes were dying off. Under the internal administration of salicylate of sodium the eye became quiet. Dr. Snellen concluded that descemetitis was really a disease *sui generis*, and should be known by that name, and not as serous iritis or cyclitis. Further, he held, that it was due to microbes growing in the anterior chamber, which, by the toxins they produced, caused irritation of the uveal tract. The dots, which were situated at first on the cornea might form subsequently

on the iris, lens, and ciliary body. They consisted of microbes at first, with which leucocytes became intermixed subsequently. Whether some cases depended upon deposit after inflammation of the deep parts remains to be proved.

OTOLOGY.

ABSTRACTS FROM ENGLISH AND AMERICAN CURRENT OTOLOGICAL LITERATURE.

BY LEONARD A. DESSAR, M. D.,
OF NEW YORK.

INCIPIENT INFLAMMATION OF THE EAR IN EARLY LIFE.

Dr. S. M. Smith (*New York Medical Journal*, July 21, 1894), calls attention to the necessity of the general practitioner acquainting himself thoroughly with the management of primary aural diseases, as the great majority of ear diseases (except traumatism) have their incipency in infancy and early childhood. Among the large number of excellent suggestions presented, the following are cited here:

1. It is well to examine the external auditory canal of the new born child, and if it be free from accumulated material, and the membrana tympani is found to be congested, the tympanic cavity should be inflated by Politzer's method. If, however, this fails to relieve the symptoms, the drumhead should be carefully punctured and inflation again used, when relief will be almost immediate.

2. It is the imperative duty of every practitioner to be able to promptly recognize and immediately care for an acute suppurative inflammation of the tympanic cavity.

3. Deaf-mutism is not a distinct disease in itself, but must be accepted as a symptom, or better still, as a sequela of an existing disease.

4. Out of 51 deaf mutes that consulted the author in the past few months, 37 acquired their affliction, while the remaining 14 were congenital. Of the acquired ones 21 resulted from scarlet

fever, 9 from diphtheria, 5 from measles, and 4 from traumatism : 9 were between the ages 1 and 2 years, 16 between 2 and 3, and 12 between 3 and 5. He thinks that it is safe to assert that most of these acquired cases would have been prevented if the pus in the tympanum had been promptly evacuated at the proper moment, followed by mild antiseptic irrigation of the external auditory canal, inflation of the tympanic cavity, blood-letting, and the proper care of the throat.

NEW METHODS FOR RELIEF OF IMPAIRED HEARING.

In an interesting paper Dr. Louis J. Lauterbach, of Philadelphia (*College and Clinical Record*, July, 1894), describes a number of comparatively new methods of treating the ear, comprising the use of the phonograph, the vibrometer, vibrophone and metronomic ear masseur. On the ground of his observations, which have been quite favorable, he presents the following conclusions :

1. Poor hearing, when unconnected with closure of the meatus or disease of the nerve, is usually the result of some want of mobility in the sound conducting apparatus :

2. This want of mobility can almost always be overcome by the use of massage, especially pneumo-massage applied directly to the membrana tympani or ossicles :

3. That the pneumo-massage in ordinary cases is the most serviceable, phono-massage being especially indicated where there is a necessity of exciting the atony of the auditory nerves caused by disease : as

4. That the mobility of these parts increases, the hearing is restored and the tinnitus disappears ;

5. That the results are most favorable in cases of hypertrophic catarrh, and in cases with retracted or perforated membranes following suppuration : less favorable in the proliferous variety of catarrh and unfavorable in the atrophic variety, and in cases of involvement of the auditory nerve endings.

6. That the treatment will in great part supplant the removal of the ossicles and similar operations, which operations should never be entered on for the restoration of hearing or the removal of tinnitus, until massage methods have been given a thorough trial.

AEOTHERAPEUTIC TREATMENT OF EAR DISEASES.

Dr. J. J. Hovent, of Brussels (*Food*, August, 1894), details the results of his experience with the compressed air bath, in diseases of the ear. During the period from January, 1892, to

February 1894, he has treated ninety-four cases, with complete cures in thirty-six and considerable improvement in twenty-two. The author's conclusions are as follows:

1. The compressed air bath is very useful in cases of nervous deafness;
2. The compressed air bath is antidyscrasic and antidiathetic. By its super-oxygenation it is applicable in cases of deafness with abnormal composition of blood;
3. The compressed air bath is antiphlogistic, antiseptic, and may be rendered aseptic. These properties are quite obvious in catarrhal deafness, with or without otorrhea, in the obstruction and stricture of the Eustachian tubes.
4. The compressed air bath is the best means to be employed for the massage of the tympanic membrane. It acts powerfully and innocuously on the two surfaces of that membrane. It is indicated in exudative inflammation, in polypus growths, in hypertrophic or atrophic catarrh of the middle ear, in ankylosis of chain, etc.

INTRA-NASAL GROWTHS AS FACTORS IN AURAL AND LARYNGEAL CATARRH.

Dr. Sargent F. Snow (*Med. Record*, August 18, 1894) states that he has found no case of post-nasal, middle ear, or laryngeal catarrh which was not accompanied by marked evidences, past or present, of pressure or contact of some of the surfaces in this region.

Many of these cases have shown a perfectly normal condition of nose in lower third, both inferior turbinated bodies apparently healthy, and patients claimed that they had no trouble in breathing, each nostril being perfectly free; their complaint, as they say, "is further back, or down," sometimes in the ear, sometimes in the larynx, and oftener their only symptom is of "something dropping into the throat."

A close examination of the upper portions of the nose will show, almost invariably, some point or points of contact between the middle turbinated and the septum or the outer wall of the nose, which, though slight in many instances, is, in the author's opinion, the cause of a great, and perhaps the whole part of the trouble, particularly if the contact be persistent.

DISEASES OF THE EAR AS A COMPLICATION IN EPIDEMIC INFLUENZA.

Dr. Lawrence Turnbull, of Philadelphia (*Medical and Sur-*

gical Reporter, July 28, 1894), formulates the results of his observations of ear diseases following, in the following conclusions:

1. There is a peculiar inflammation of the ear termed influenzal otitis;

2. It almost always commences with hemorrhagic, dark blue or black bullæ seen in the lower posterior segment of the membrana tympani;

3. After a time a perforation of the membrana tympani takes place, with a discharge of bloody muco-serous fluid;

4. The pain, which is severe before the perforation, is not entirely relieved by it, and continues assuming more of a neuralgic character. There are subjective noises (*tinnitus aurium*) such as pounding, hammering, and roaring, and if not properly treated by inflation or Politzer's douche or the catheter, remain after all the inflammation has ceased;

5. Fatal results may follow from meningitis, abscess of the brain, and more frequently sinus phlebitis. Such cases we are called on to diagnose, being sent to our clinic as abscess of the brain.

NOTES ON DISEASES OF THE UPPER AIR PASSAGES IN APEX CATARRH.

Dr. Howard S. Straight, of Cleveland (*Med. Record*, September 22, 1894), has observed a condition simply called "lowered vitality, general depression, etc.," but which he designates "Apex Catarrh" in a large proportion of the cases of nose, throat and ear disease occurring in his practice. This condition is especially prevalent in patients from 8 to 40 years of age. Patients who have an apex catarrh are very susceptible to colds which may involve any part of the upper air passages, or the middle ear, or the entire mucous membrane, and do not yield readily to treatment. Nearly one-half of all the cases of ear disease in patients from 8 to 40, that pass under the author's observation, have apex catarrh.

While the increased susceptibility to colds accounts for the acute inflammations of the middle ear that are so often seen in patients with apex catarrh, he has been repeatedly surprised at the number of cases of chronic middle ear inflammation that present themselves on account of their increased suffering under a similar constitutional condition. These patients are often people who have suffered for years from marked loss of hearing, and who have ceased to believe that there was any hope of relief. Upon the development of an apex catarrh, they begin to suffer more

from catarrh of the upper air passages, and to complain more from the subjective symptoms. The examination of the ear often reveals simply marked changes from an old inflammation, and yet no trace of any acute trouble.

Such cases under creosote, without any local treatment, very soon regain their usual amount of hearing. The author strongly urges the importance of treating the apex catarrh by the use of tonics, iron, etc., in connection with the local treatment.

NOTES FROM FOREIGN OTOLOGICAL JOURNALS.

BY T. MELVILLE HARDIE, B. A., M. D.,
OF CHICAGO.

HISTORICAL ACCOUNT AND TECHNIQUE OF OPERATIONS FOR THE THOROUGH OPENING OF THE MASTOID AND MIDDLE EAR.

Zaufal. (*Archiv. f. Ohrenheilk* XXVII., 1 and 2. Aug., 1894), presents one of the most important contributions to otology of the year. To Von Trötsch and Schwartze are accorded the position of pioneers in the radical operations upon the middle ear and adjacent mastoid. As the Schwartze operation has been proved to be inadequate to the cure of many of the chronic cases the tendency in otological surgery has been in the obvious direction of complete operation. Küster's dictum that a rational surgical procedure must "von dem Grundsatz ausgehen" the bone must be extensively opened and everything diseased seen and removed is now generally accepted; and Zaufal considers this best attained by his operation, to be presently described. Zaufal's side as to priority over Hartmann in the description of the operation is given at length in the paper and the comparative merits of his own and Stacke's operation presented with fine clearness and impartiality.

Zaufal discusses his operation under the following heads:

1. *The laying bare of the field of operation.*
2. *The removal of the superior membranous lining of the pars ossee of the external meatus.*

3. *The opening of the antrum by chiselling of the mastoid process and the complete removal of the posterior bony wall of the external meatus.*

4. *The removal of the pars epitympanica.*

5. *Curetting, etc., of the operation cavity.*

6. *Sutures and bandaging.*

7. *After treatment.*

1. Laying bare of the field of operation. An incision beginning 2-3 cm. below the tip of the mastoid process is carried perpendicularly upwards, through skin and periosteum, over the middle of the process to about 2 cm. above the linea temporalis. From the upper extremity of this forward 3-4 cm. the posterior border of the temporalis muscle being, as a rule, cut through. Very great infiltration makes the extension of the horizontal incision backward for 1-2 cm. occasionally necessary. If the sigmoid sinus is to be exposed, the horizontal incision must extend 3-4 cm. backward. After tying the arteries the flaps are to be carefully raised with a Hagenbeck raspatory, first anteriorly. The insertion of the head of the sterno-cleido-mastoid must be cut through with a scalpel, until it is possible to insert the finger on the inner side of the tip of the mastoid. Then the periosteum is to be raised backward as far as the posterior border of the process.

2. For removing the upper and posterior portion of the membranous lining of the bony meatus Zaufal gives the following directions: First insert a drainage tube corresponding in size with the lumen of the meatus and cut through the posterior half of the membranous lining at the margin of the bony meatus with a sharp-pointed bistoury, and withdraw the tube. Next, the short, narrow, sharp-pointed bistoury is introduced as far as the margin of the drumhead and the membrane cut through in a direction corresponding to the upper margin of the anterior wall of the pars tympanica; a second parallel incision is made in the same way below and posteriorly. The flap so cut through is carefully raised from the bone and readily withdrawn by means of forceps. Zaufal, in comparing his treatment of the membranous lining with Stacke's, admits that theoretically Stacke's is the more nearly correct, but contends that practically his own method is the better, because it is impossible to separate and withdraw intact the membranous lining, and the portion left behind in the innermost part of the canal is for the most part destroyed in chiselling the pars epitympanica and the outer wall of the antrum, and further, that a portion of the thinner lining on the anterior wall is nearly always torn by the

raspatory and dies. He contends further that there is much less danger of stenosis and adhesions when the lining is left on the anterior, the inferior, and postero-inferior walls of the meatus than exists when the bony canal is completely laid bare and necessarily covered later with granulations. He advises the insertion of a thin drainage tube in the external meatus during the chiselling away of the upper posterior wall so that the anterior wall may escape injury.

3. Zaufal prefers the gouge to the flat chisel as being better suited to the curved contour of the bone. It varies in width between 1 cm., 6 mm., and 5 cm. The length with handle is 21 cm. For the removal of bony projections he uses the bone forceps of Luer in two sizes. Fissures in the bone are not to be feared. Zaufal has never observed any. The cutting edge of the forceps must always be held perpendicularly to the surface of the bone and the piece of bone engaged must be bitten off without any to and fro movement of the forceps. The operation varies according as the mastoid process is made up of pneumatic or compact bone. Fistulae are, of course, more frequent in the first group. In the pneumatic bone whether a fistula exists or not, one begins with the widest gouge 1 cm. behind the posterior margin of the bony meatus and directly below the linea temporalis and removes thin flakes forwards and inwards. The second and third applications of the chisel begin a little posterior to the first. As soon as a cavity containing pus, granulations or cholesteatoma is opened sufficiently the bone forceps is used. If a fistula exists it is to be enlarged, first with the chisel and then with the bone forceps. When one comes upon a gray shining membrane care is necessary as it may be cholesteatoma, the pyogenic membrane of an abscess or the wall of the sinus. Two dressing forceps are used in the investigation. In the solid mastoids the chiselling is begun in the same way and situation, and the broad thin flakes are removed level with the inferior border of the opening of the bony meatus. If even yet no cavity is opened a smaller gouge is used and the upper half of the cavity is opened forwards and inwards as posteriorly we should expect to find the sinus. If the linea temporalis projects in such a way as to greatly limit our view of the field it is to be rounded with the gouge from above downwards. The upper part of the bony meatus should be removed at the same time. As one proceeds, a sound with its point bent at a right angle should be introduced through the external meatus into the antrum so that the thickness of the bridge of bone still remaining may be estimated

and the exact location of the antrum determined. After the antrum has been reached a thin straight bone forceps may be used to enlarge the opening posteriorly.

4. The removal of the pars epitympanica. If the ambos is in sight anteriorly it is to be removed, but if hammer and ambos are imbedded in granulations as is usually the case, Zaufal loosens the mass and pushes it forward into the middle ear until the removal of the pars epitympanica has been effected with forceps or chisel. If the forceps be used, one blade is introduced from the antrum cavity and the other from the external meatus and the bone gradually pinched off. When using a small chisel it must be placed on the upper anterior end of the posterior free border of this bony plate and struck carefully in a downward, forward and outward direction, then the postero-inferior part in the same way. Or one may chisel from the external meatus if he first protects the inner wall of aditus and middle ear with a bent sound or Stacke "schetzhebel," and finally with the favorite straight Luer bone forceps.

5. When curetting and cleansing the cavity it is better to begin at the edges and proceed gradually further in. The sharp spoon is as a rule the best instrument. When cholesteatoma or caries exists the bone must be very thoroughly scraped. Small depressions are to be scraped with a small spoon. If the wall of the sinus is bare, that part of the cavity should be left until the middle ear has been cleansed, so that in the event of bleeding the bandage may be immediately applied. Zaufal uses the Pacquelin cautery in cholesteatoma, if there is a bony wall surrounding the cavity. With an exposed dura or sinus wall this is not done, and the facial nerve must never be forgotten. More recently, Zaufal has instead used tincture cantharidum, especially in the after-treatment.

The removal of ossicles is to precede the curettement of the antrum and middle ear and as they are usually covered with granulations, our anatomical knowledge must be brought into requisition. The tendon of the tensor tympani is first cut through and then the connections between ambos and stapes. The ambos is removed with forceps and then the hammer which offers much more resistance; occasionally the use of the sharp spoon is necessary. When curetting the cavity an assistant is entrusted with the task of observing the face for twitching of the muscles supplied by the facial nerve. Zaufal uses ordinarily a heart-shaped curette and a smaller round one.

Curette first the antrum, thence proceed by way of the roof of

the attic and middle ear to the upper wall of the Eustachian tube, then the floor, and the posterior, inferior and inner wall of the middle ear, where, on account of the facial nerve, care must be taken not to scrape with too much vigor. After irrigation with a 1:1000 sublimate solution and drying, search is again made with a probe for carious spots, the posterior wall of the antrum being removed if required. The cantery is used as indicated above, the cavity once more irrigated and the bleeding stopped.

6. Zaufal sutures the horizontal incision and the upper 3 to 4 cm. of the perpendicular. Then follows a second careful irrigation. The tamponing of the cavity is done first from the external meatus. A strip of iodoform gauze, about 4 cm. wide, is introduced by means of forceps to the bottom of the cavity. A similar strip in the external wound, and the remainder of the cavity filled with a large tampon of the same material. Great pressure of the gauze in the middle ear is to be avoided on account of possible injury to the facial nerve. External to the iodoform gauze come successively sublimate gauze, absorbent cotton and a moist gauze bandage. The wound is to be dressed for the first time in five to six days, then in three days, later daily.

7. The after-treatment will be discussed here only with reference to the advisability of securing a permanent opening by skin grafting in the mastoid process. Schwartze, Stocke, Siebenmann and others endeavor to secure this opening; Zaufal does not. He contends that the attempt to cover this cavity with epidermis can be successful only when the cholesteatoma has been radically extirpated and that when it is destroyed the permanent opening is unnecessary. If cholesteatoma again develop in the middle ear after the mastoid opening has closed he would prefer to operate a second time. He considers further the scar a *locus minoris resistentiae*, and that any inflammatory products which might develop would use this scar as an opening and in this way an extension of inflammation to the cranial cavity be prevented.

THE TENOTOMY OF THE TENSOR TYMPANI IN CHRONIC MIDDLE EAR INFLAMMATION.

Hoffmann reports the results in twenty-two cases operated upon in the Jena clinic. Subjective sensations disappeared in four cases after the operation. In one case, in a year after the operation. The hearing power was improved in 15 per cent, unchanged in 45 per cent, diminished in 40 per cent. For whispering speech, improvement in 50 per cent, unchanged in 35 per cent, diminished

in 15 per cent. The purulent discharge ceased in 40 per cent; in two cases there was no otorrhea at the time of the operation, and none developed since; in 40 per cent there has been a discharge. With regard to the hearing, improvement is to be expected only if there is no anchylosis of the stapes, no affection of the auditory nerve and no extensive adhesions in the middle ear; a cure of the purulent discharge only in such cases as are not complicated by caries. The author considers that we have in tenotomy a conservative method of treatment and that from the practice of this operation we have learned much relative to the clinical significance of perforations situated at the upper and lower extremities of the hammer respectively. In the former we may almost invariably expect caries, while the latter, on the contrary, are present in uncomplicated cases of purulent otitis media.

RHINOLOGY AND LARYNGOLOGY.

ABSTRACTS FROM CURRENT LARYNGOLOGICAL AND RHINOLOGICAL LITERATURE.

By M. D. LEDERMAN, M. D.,
OF NEW YORK.

FOLLICULAR TONSILLITIS, ETC.

Dr. N. Wolfenden (*Jour. of L., R. et O.*, Vol. 8. No. 8). After a most scientific discourse on the pathology of follicular tonsillitis, the author states that in the future a diagnosis will be made bacteriologically. He furthers the suggestion of Bulloche, who divides the subject into as many varieties as there are distinct micrococci found under the inflammatory conditions. The "pneumococcal" and "staphylococcal throats" are not as contagious as the "streptococcal" variety. The latter resembles infectious diphtheria, with the distinction that in infectious diphtheria the Loeffler bacillus is in combination with streptococci, and is usually fatal, while in the streptococcal form Loeffler's bacilli are absent, and the disease, even if serious, may get well.

Streptococcal throats are not contagious, in the ordinary usage of the term, and paralysis has never been seen to follow its presence. Placing patients with the streptococcal throats in a

diphtheria ward, subjects them to a true attack of diphtheria of a most virulent and fatal character. Membrane may be found in all the above types, with the usual manifestations of sore throat. Antiseptics is the treatment indicated.

REFLEXES ORIGINATING FROM THE NOSE, PHARYNX AND LARYNX.

Dr. R. Casadesus, Barcelona, (*Ibid*). Some of the many peculiar symptoms arising from intra-nasal, pharyngeal and laryngeal irritation are vividly demonstrated in the histories of the cases reported by the observer. In one case, a young girl of 16 was the subject of hysterical convulsions. These attacks were brought on by irritating the inferior turbinals; and were promptly relieved by applying a 10 per cent solution of cocain to the parts. Cauterization of the sensitive areas resulted in a cure.

In the second instance, a lady, 35 years of age, complained of headache, palpitation, dyspepsia, œdema, both fixed and erratic, insomnia, etc. Some nasal obstruction brought her to the author for advice. Applications of cocain relieved the headache and a suffocated feeling, but in attempting to leave the office the patient was attacked with symptoms of hystero-catalepsy. Wishing to ascertain whether these attacks were of nasal origin, the turbinals were irritated by means of the probe, and the cataleptic symptoms soon appeared. The sensitive zones were cauterized, which procedure brought about an amelioration of all symptoms.

The third observation was a 16-year old girl of a hysterical nature. She complained of a peculiar sensation in the throat. Touching the slightly hypertrophied inferior turbinated bodies brought on a strong convulsive attack. After a moment's intermission the attack reappeared. The following day an application of cocain stimulated another seizure, and these symptoms returned quite frequently during the succeeding day. The inferior turbinals were freely cauterized, and after several visits the symptoms did not return. The feeling in the throat persisted, however. On careful examination, a sensitive spot was discovered in the left tonsil, which, when irritated, produced a convulsive paroxysm. The author thought this to be a transposition of the hystero-genetic zone. This hyperæsthetic region was treated in the usual manner, and the patient was completely cured. The latter operation was performed without an anesthetic, as the slightest contact of the brush provoked an attack, causing the patient to tightly close her jaws.

The author states that after careful observation, his experience corroborates the opinion of Lichtwitz: "(1) The existence of hystero-genetic zones in mucous membranes; and, (2) That the said zones represent a more important part than that of being simply sympathetic, because their destruction terminates the series of nervous functional perturbations deriving from them."

REPEATED PERFORATIONS OF THE CRICO-THYROID MEMBRANE FOR TREATMENT BY SPRAYS, ETC.

Dr. Rousal, (*Ibid*). No unpleasantness has followed this method of applying local therapeutic agents in the treatment of tubercular disease, both local and pulmonary. The observer punctures the membrane with an exploring needle (five centimeters long), and then injects with a syringe (capacity five cubic centimeters). In tubercular œdema of the glottic tissues, he advocates the injection of pilocarpin or strychnin. As "a topical modifier of diseased tissues," he recommends arsenat of strychnin, hyper-sulphit and phosphat of soda, or a solution of pure carbolic acid in almond oil. Only solutions of menthol, thymol, etc., are sprayed directly into the trachæ for pulmonary absorption. The operation does not disturb the patient very much, and leaves no trace afterwards.

TRACTION ON THE TONGUE IN HYSTERIA.

F. Balade, (*British Med. Journal*, No. 1758). In two cases this novel method has resulted in a cure after all other treatment had failed to relieve violent paroxysms. The tongue must be drawn out of the mouth with some force.

THE TRUE NATURE OF "FALSETTO."

E. D. Palmer, Mus. Bac. Hon. (*The Lancet*, No. 3706). In a letter to the editors, the author states emphatically that the "ordinary voice" is "produced throughout by precisely the same mechanism as that employed in the production of the so-called 'falsetto:'" and "falsetto" itself is the remains of the rightly produced voice after years of wrong production.

TREATMENT OF DIPHTHERIA BY INSUFFLATIONS AND TABLOIDS OF SULPHIT OF MAGNESIUM.

H. Brabant, M. R. C. J., (*Ibid*). This therapeutic agent has given good results in the manner indicated. Insufflations should be carried out every two hours, accompanied by the usual stimulants, together with iron and chlorat of potass.

TUBERCLE BACILLI IN THE NASAL CAVITIES OF HEALTHY MEN.

Dr. Strauss (*Maryland Med. Journal*, whole No. 700). Tampons of sterilized cotton wool were placed into the nasal cavities of twelve healthy subjects and afterwards shaken up in sterilized bouillon or water. This liquid was injected into the peritoneal cavity of twenty-nine guinea-pigs. In seven cases the animals died of septicemia or purulent peritonitis. In nine cases which died or were killed at the end of three or five weeks, the post-mortem revealed undeniable tuberculous lesions. These experimentations prove conclusively that tubercle bacilli may enter the system through the nose; may not infect the individual while inhabiting this region, and still be virulent enough to cause the disease when injected into animals. These demonstrations show how repeated epistaxis in a patient may lead to a tubercular affection.

NASO-PHARYNGEAL FIBROMA.

Dr. R. H. Woods (*The Dublin Journal of Med. Sciences*, No. 173). The patient was a young man, 24 years of age, who complained of complete nasal obstruction, associated with giddiness, failure of memory and great drowsiness. On examination the whole naso-pharynx and the greater part of the left nasal fossa were filled with a typical fibroma. His voice was without nasal tone. The growth was removed by means of a "galvanic curette" invented by the author. The instrument consisted of "a semi-circle of platinum wire brazed to the ends of two insulated copper rods." The tumor was cut away piecemeal; sometimes applying the curette through the nostril, and then posteriorly. Bleeding was not marked, nor did the patient experience much suffering. The voice returned to a normal tone.

LARYNGEAL LEPROSY.

Dr. Paul Bergengrün, Rega (*Archiv. für Laryng. und Rhinologie*, Vol. 2, No. 1). The nine observations were made from the larynges of the individuals who during life showed the true tubercle of leprosy. The microscopical examination showed in general a marked retraction of the epiglottis, with a knotty hypertrophy of its mucous membrane, both of the laryngeal and lingual surface, but especially noticeable on the latter surface. The ary-epiglottidean ligaments were usually thickened, twisted and shortened. The true and false chords presented the peculiar

warty appearance as that noticed on the epiglottis. This overgrowth seemed to affect the "processus vocalis" more markedly than any other portion of the chords. Below the glottis, the mucous membrane was hypertrophied in the same manner. In some cases there were signs of perichondritis.

IDIOPATHIC ACUTE PERICHONDRITIS OF THE NASAL SEPTUM.

Dr. A. Kuttner, Berlin, (*Ibid*). Three instances of this rare affection are reported. Obstructive symptoms, with pain, redness and fluctuation existed. Incision, curetting the abscess cavity and tampons of iodoform gauze was the treatment employed.

ANTIPYRIN A LOCAL ANESTHETIC IN DISEASES OF THE LARYNX AND PHARYNX.

Neuman, Pest, (*Internat. Centralblatt für Laryng. und Rhinol.*, Vol. 11, No. 2) states that the drug is of advantage as it does not cause unpleasant symptoms. In 30 to 50 per cent solutions it acts as a germicide. Combined with starch, he blows it into tubercular larynges with agreeable results.

NOCTURNAL ENURESIS DUE TO NASO-PHARYNGEAL DISEASE.

Dionisio, Turin, (*Ibid*). Adenoid growths were the irritating factors in this instance. After their removal, the 10-year old female patient improved. An attack of coryza brought on the old trouble a month later, but after the cold in the head was relieved the enuresis disappeared.

XEROSTOMIA (MOUTH DRYNESS) WITH DRYNESS OF THE NOSE AND EYES.

Dr. T. R. Frazer, Edinburgh. This peculiarity has never before been observed. The dryness of the eyes followed a nervous shock, while the mouth and nasal dryness followed the extraction of a tooth, and afterwards wearing a false set of teeth. Some improvement was noticed after the the patient held a weak solution of pilocarpin in the mouth.

SPONTANEOUS HEALING OF A LARYNGEAL POLYPUS AFTER TRACHEOTOMY.

L. Stembo, Wilna, (*Ibid*). After a necessary tracheotomy for some existing disease, a polypus situated beneath the left vocal chord, disappeared in three months without further attention.

ACCURATE AND CONVENIENT PRISM-SPECTACLES FOR INNERVATIONAL GYMNASTICS.

BY GEORGE M. GOULD, M. D.,
OF PHILADELPHIA.

IN the treatment of muscular imbalance by innervational gymnastic exercises I have found no method of using the prisms satisfactory. Hanging prism-fronts upon the spectacles worn, drags upon the frame and gets it out of adjustment, especially when high powers are used, and besides, by such a plan there is no accurate and close adjustment of the prisms themselves. Non-interchangeable prism-spectacles are expensive, heavy, and troublesome in many ways. Round interchangeable prisms have all these disadvantages and the fatal one of inaccurate adjustment, and



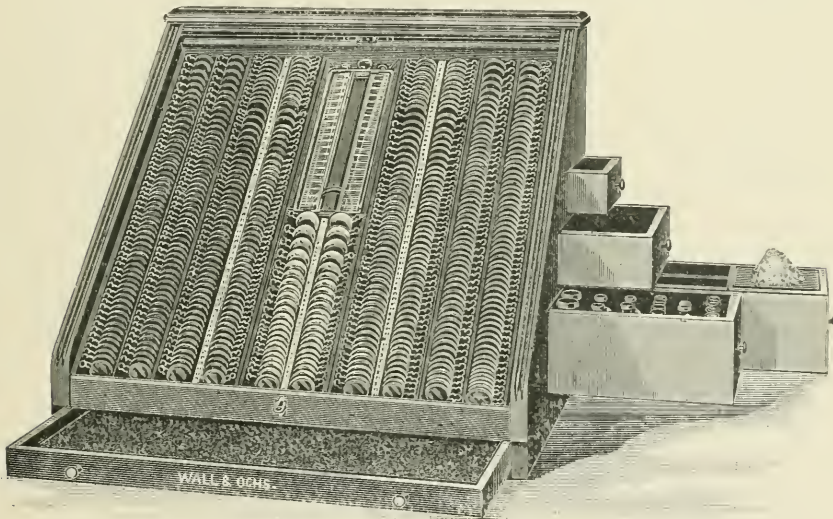
inaccurate placing of the base of the prism. The treatment by innervational gymnastics has value in proportion to the accuracy with which the prisms set before the eyes. Nothing for example could be more outrageous than the plan I have heard of being used of permitting the patient to hold the prisms in the hands while attempting the exercise. The innervation of the muscles must be precise and always the same. This may be perfectly effected by means of the little device here pictured. The frame is rigid, without movable parts and hence holds the prisms accurately horizontal. Having once been rightly adjusted to the peculiarities of a face it will not get out of shape. Prisms of all powers, and either with the bases in, out, up, or down, may be used with the same frame. The facility of changing the prisms at pleasure is very convenient. By grinding the interchangeable lenses in a rectangular form, as shown, accuracy of alignment is secured together with a lightness of weight scarcely if any exceeding that of an ordinary spectacles. In all ordinary degrees of exophoria, (the defect that constitutes nine-tenths of the muscular troubles we are called upon to treat), I find that the gymnastic exercises

quickly call for higher degree prisms until in a short time the exophoria has disappeared. It is of great advantage, therefore, to be able to supply such prisms successively and readily with no refitting of frame, etc., and at a minimum cost. Indeed, if the optician charges but a small sum for *lending* the outfit, the expense to the patient is inconsiderable.

A NEW STYLE OF A CASE OF TRIAL-LENSES.

BY GEOEGE M. GOULD, M. D.,
OF PHILADELPHIA, PA.

IN devising the case of test-lenses, illustrations of which are herewith given, I had in mind as my chief object to minimize



The Case of Trial Lenses with the roller top pushed up, showing the lenses in position and the drawers partly drawn out.

the vexation and labor of the routine work required in using the old style of flat case, by placing the lenses in racks fixed on an incline at an angle of about 60 degrees, so that the numbering of each lens could be plainly seen and the lens itself picked out of its place with ease when required. If one uninterruptedly works at refraction four or five hours a day by the subjective method, every movement or motion saved, every bend of the body or scrutinizing glance spared becomes in the total an important consideration.

Sitting at the right of one's patient the arrangement of the lenses is such as to economize time, and mental and physical exertion. The most used lenses are the weak plus sphericals and the weak plus cylinders, and these are placed in the lowest part of the racks in front by the right hand. The higher power lenses are graded regularly and progressively higher toward the top of the case. The minus lenses are similarly placed at the left. The prisms occupy the lower central space; the miscellaneous lenses the upper lateral central space. I have had a space fitted to receive the "double battery" of prisms which I use, so that this instrument is always at hand. A shallow drawer below, extending the full width and length of the case, gives a temporary place in which to drop the lenses just used when he has not time to put them back in the proper slots. The drawers extending entirely through the case from side to side behind and below the lens-racks may be of the sizes and partitioned as desired to hold all the instruments, drugs, etc.—the entire armamentarium of the oculist. The weight of the flexible roller-top is neutralized by a spring roller so that closing or opening the case is quickly and easily effected. Besides the color of the cells, the handles of the minus lenses have a piece gouged out of each, so as to make the distinction more easy when a number are lying in the drawer below, or when one may have been misplaced in the rack.

There are twenty-three pairs of prisms, forty-eight pairs each of + cylinders and of — cylinders, and fifty-eight pairs each of + spherical and — spherical lenses. The handles on all lenses are made solid so as to permit of the use of large figures, also are soldered flush with the bottom edge of the cells. This permits two lenses being placed back to back; it also makes a much neater finish in burnishing the lenses in the cell. All the sphericals are plano-concave and plano-convex. In neutralizing them this will be found a decided improvement over the old form.

The numbered strips are all dead-black metal with white enamelled figures, making the replacing of lenses very easy. The case is made of solid mahogany throughout. It is constructed for purposes of time-saving and labor-saving, and is designed to last a life time. It is a beautiful piece of workmanship. Messrs. Wall & Ochs of Philadelphia, are the manufacturers.

PROFESSIONAL NEWS.

Dr. Edward Jackson, of Philadelphia, passed through St. Louis October 25th, on his way to Denver, where he expects to remain a few months for the purpose of giving his wife, whose failing health requires attention, an opportunity to be benefited by the climate.

Dr. Rolland C. Hodges has resigned the lectureship of ophthalmology and otology in the Medical Department of the University of Texas and removed from Galveston to Houston, Texas. Dr. Hodges bade his friends good-by at Detroit, Mich., and went to Texas fourteen years ago, to die, but through a mistake in prognosis he disappointed the coroner and regained his former robust health, and now takes care of an extensive practice, which will be much increased by his locating in Houston.

Dr. Edwin L. Sessions, of Hillsboro, Texas, has been so unfortunate as to lose his home, library, instruments, and all that a physician is expected or allowed to have, by fire, but he is not the kind of a man who gets discouraged or becomes despondent under the frown of the fickle goddess of (Miss) fortune. Dr. Sessions has by his good work in the practice of ophthalmology and otology laid the foundation of an imperishable fortune in the hearts of his grateful patients and his energy will enable him soon to accumulate many times the amount of his losses. It is easy to say "physicians should have their property insured like business men," but most of us neglect it like Dr. Sessions.

Dr. A. G. Aldrich will remove from Anoka, Minn., to Saint Joseph, Mo., on or about the 1st of December. The number of reading ophthalmologists in Missouri is so small that we take great pleasure in changing the address of Dr. Aldrich on our subscription list, and we are confident that he will have no cause to regret locating in "St. Joe." There is work in the State of Missouri for many more well trained, capable ophthalmologists.

It will be observed that the paper on "Toxic Amblyopias," by Dr. Casey A. Wood, is concluded in this issue of the ANNALS. Dr. Wood has devoted a large amount of time and labor to the

preparation of the paper. One has but to look over the list of references to be convinced that nothing on the subject has escaped. The value of the work, for reference, is obvious. As the subscribers to the ANNALS are aware, Dr. Wood has been working on the subject three years, and publishing as much as we could make room for in each issue of the ANNALS, so that the "400" who subscribed for the ANNALS the first year of its publication will have the work complete in their volumes of the ANNALS, but for the accommodation of physicians who did not subscribe for the ANNALS the first year, Dr. Wood has ordered a small number of reprints, which will be bound in book form with a complete index, which will be highly appreciated by the well informed physician. The book will be a handsome volume of considerable size.

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